

Faculty of Health Sciences

**A worksite-based self-management program to improve men's health in
rural Western Australia: The Industry 'Waist' Disposal Project**

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**This thesis is presented for the Degree of
Doctor of Philosophy
of
Curtin University**

February 2015

Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Signature: Kristi Holloway

Date: 25th February 2015

Acknowledgements

Firstly, I would like to express my gratitude to all of the participants and organisations who were involved in this project. Without their assistance, this research would not have been possible.

A sincere thank you goes to my supervisors, Professor Samar Aoun and Professor Duncan Boldy. Their encouragement, wisdom and guidance will be forever appreciated. Thank you also to Dr Ruth McConigley and Professor Leanne Monterosso, for their help at the beginning of this project. A special thank you must go to Ann Heward and Tyler Quinn for their assistance with delivering education and Ann for also expertise with the lifestyle coaching. I am also grateful to Nicole Mynott for her assistance with editing.

Thank you to Alistair Bruce for everything. For his patience, carefully considered advice and encouragement, I will be forever grateful. A heartfelt thanks goes to my cherished friend Rebecca Dillon for her incredible support, tentative listening and proof reading skills. I would also like to thank Galvis Williss for his forestry expertise, kindness and ongoing reassurance. Thank you to my friend and mother, Anita Davis. Her willingness to be actively involved in my studies has been instrumental in my career and completing this work. A special thank you to Brett Touchet for his love, patience and unfailing support during this long and often difficult journey. Finally, to my wonderful family and friends for their belief in me and for their support, for which has made this possible.

This project was supported by an Australian Postgraduate Award (APA), Curtin University Postgraduate Scholarship (CUPS) and the Western Australian Nurses Memorial Charitable Trust.

Acronyms and Abbreviations

ABS	Australia Bureau of Statistics
AIHW	Australia Institute Health & Welfare
ANPHA	Australian National Preventive Health Agency
ANZSCO	Australian and New Zealand Standard Classification of Occupations
ABHI	Australian Better Health Initiative
BMI	Body Mass Index
BWA	Behaviour Works Australia
CVD	Cardiovascular disease
COHFE	Centre for Human Factors and Ergonomic
CI	Confidence Interval
CG	Control Group
COAG	Council of Australian Governments
DoH	Department of Health
DoHV	Department of Health, Victoria
DoHWA	Department of Health, Western Australia
DPAS	Global Strategy DPAS
ES	Effect Size
I^2	percentage of variation across studies due to heterogeneity
IG	Intervention Group
kg	Kilograms
p	Level of Significance
MD	Mean Difference
m^2	Meters squared
MI	Motivational Interviewing
NHMRC	National Health and Medical Research Council
NHPA	National Health Priority Area
NICE	National Institute for Health and Care Excellence
NIH	National Institute of Health
NPHS	National Preventative Health Strategy
NPHT	National Preventative Health Taskforce
n	Number
OR	Odds Ratio
%	Percent
RCT	Randomised Control Trial
RR	Relative Risk
SIGN	Scottish Intercollegiate Guidelines Network
SD	Standard Deviation
SGCRA	Standard Geographic Classification Remoteness Areas
SMD	Standardized Mean Difference
TTM	The Transtheoretical Model
WA	Western Australia
WPHP	Work Place Health Promotion
WHO	World Health Organisation

Abstract

Chronic diseases are some of the most widespread, costly and preventable of all health problems, and they are a major concern because of the significant burden they place on individuals, communities and health services. Obesity is a leading risk factor for the development of many chronic diseases and it has been identified as one of the most serious public health challenges of this century. Gender inequalities in health continue to exist and ‘working class’ men in rural areas are at an increased risk of being obese and developing chronic diseases. Many risk factors for chronic disease development in this group can be avoided or modified. Research has demonstrated self-management programs to be effective at inducing behavioural change and reducing risk factors, and the workplace has been identified as an important setting for health promotion and disease prevention. However, there is a lack of literature that specifically examines self-management programs in worksites that target men at risk of developing chronic disease, particularly those in rural areas.

Research involving a community-based self-management concept, *The Rotary ‘Waist’ Disposal Challenge* developed by Aoun, Osseiran-Moisson, Collins, Newton, and Newton (2009) demonstrated that this three tiered health intervention was acceptable to a male cohort in a rural area. The conceptual design was based on the Transtheoretical Model, which explains the five different stages that are common to most behaviour change, namely Pre-contemplation, Contemplation, Preparation, Action and Maintenance. The multiphase intervention was designed to deliver health benefits through three phases (Education; Body Mass Index [BMI] Competition; Lifestyle Coaching Program [LCP]) to meet the needs of participants at different stages of adopting lifestyle behaviour change.

The purpose of the study described in this thesis was to assess the feasibility of applying *The ‘Waist’ Disposal Model* in six primarily blue-collar forestry worksites in regional Western Australia. The project aimed to explore stages of behaviour change that occurred as men were empowered through acquiring self-management skills, and also to explore the factors that influence men’s health-related practices.

A mixed method study was applied to determine the feasibility of the multiphase intervention in inducing behavioural change. Phase one involved delivering education (n= 87), and the results indicated small but important changes. Although not statistically significant, there were generally positive changes noted in participants’ psychological readiness to modify behaviours relating to weight loss, fat intake and exercise. Phase two involved the delivery of a lay-led BMI competition (n= 57), which achieved some positive

physical and psychological changes among participants. There were large, statistically significant shifts from the preparation to action and maintenance stages of change, for both weight loss and exercise. Statistically significant changes in BMI and waist measurements were evident ($p= 0.001$) throughout the first six months of the BMI competition. The third and final phase, the LCP ($n= 15$), shifted participants towards healthier dietary choices. Activity levels were maintained at sufficient levels, and there was a positive progression towards readiness to adopt or maintain behaviours related to weight, fat intake and exercise. The findings suggest that this multiphase self-management intervention had a differential effect according to the phase, with education having a limited effect and the BMI competition and lifestyle coaching having a greater effect. Overall there was a positive impact on the adoption of healthy behaviours and on modifying some of the risk factors for chronic disease among the population of men studied. It was evident that, at least to some extent, the intervention was able to move men successfully through the stages of behaviour change.

The qualitative component of the study illustrated the complexity of adopting and maintaining healthy lifestyles for men ($n= 21$) working in the forestry workforce in rural areas. The central theme *My Health: My Choice* emerged as men felt that their health, and in particular an intention to reduce their weight, was their choice when it came to making desirable changes. Four sub-themes that built the core concept consisted of: *Identified Barriers*, *Identified Motivators*, *Identified Supports*, and *Experience with The 'Waist' Disposal Program*. These provided insight into how men at various stages of change responded to the multiphase intervention and the attributes associated with achieving their goals in terms of weight loss and other lifestyle changes. Participants who were in earlier stages of change, were less likely to participate or were likely to complete only the education phase of the study. They identified more barriers and were more likely to consider these barriers too significant to overcome. Conversely, men in later stages of change (namely action and maintenance) identified a greater number of motivators and were clear about what encouraged them to change. They were more willing to adopt strategies that facilitate change and were more responsive to the intervention. Importantly, these findings facilitate an understanding of the health-related issues for men working in the forestry industry in rural WA, in the context of the stages of change model.

The study's generalisability is limited by the quasi-experimental design, the convenience sampling method adopted and sample size. Key strengths of the project were that it was implemented in a real life setting and that it targeted a hard-to-reach, at-risk population of men living in rural areas. Furthermore, there were some critical success factors identified that contributed to the effectiveness of *The 'Waist' Disposal Model* in the forestry workforce, including creating partnerships with industry; being a community-based multiphase

intervention; having a flexible, yet targeted stage-based approach; being based on a behaviour health model (namely the Transtheoretical Model); having regular follow-up; and the use of applied telephone coaching. The strategies applied in this study should be transferable to other male groups living in rural areas, where accessibility and availability of such interventions is often not possible. It further supports the implementation and evaluation of worksite multiphase interventions that focus on achieving healthy outcomes through changes in diet and physical activity. Although there is a need for further research in this area, the study is nevertheless valuable in providing insight and direction for future policy, practice and research.

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Chapter One

Background and Significance

1.1 Introduction

Chronic diseases are among the most prevalent, costly and preventable of all health problems (Australia Institute Health & Welfare [AIHW], 2013a). There is conclusive evidence that obesity is a leading risk factor in the development of many chronic diseases including cardiovascular disease (CVD), diabetes and some cancers (World Health Organisation [WHO], 2014a). Obesity is now the primary cause of preventable death worldwide and has been identified as one of the most serious public health challenges of the 21st century (WHO, 2007). Gender inequality in health continues to be a major concern. 'Working class' men in rural areas are at an increased risk of being obese and developing chronic diseases (AIHW, 2013a). Many risk factors for chronic disease development in this group can be avoided or modified, such as: poor diet, excess weight, physical inactivity, tobacco smoking and excess alcohol use (AIHW, 2012). Research has identified self-management programs to be effective in reducing these risk factors (Jordan & Osborne, 2007; Nolte & Osborne, 2013; Stone & Packer, 2010). However, there is a paucity of literature that specifically examines self-management programs in men at risk of developing chronic disease, particularly those in rural areas. Furthermore, the workplace has been identified as an important setting for health promotion and disease prevention (Engbers, 2008; WHO, 2010).

This thesis presents a project that was conducted to assess the effectiveness of a self-management model, explicitly- *The 'Waist' Disposal Model* when implemented in forestry worksites in regional Western Australia (WA). This chapter presents background information relating to chronic disease and obesity in Australia, rural men's health, and work place self-management initiatives, to highlight the significance of research and health interventions in this area. Finally, the research objectives are identified. In the following chapters, a review of the literature will be offered, followed by details of the project methodology. Findings that stemmed from the project will be specified and a discussion of the results and recommendations arising from the research will be presented.

1.2 Background to the study

1.2.1 Chronic Disease

Chronic diseases are recognised as a global epidemic and are associated with many significant social, emotional and economic costs. According to the WHO (2014a) chronic diseases are the leading cause of death worldwide. In Australia, they contribute to over 85 percent of disease burden and in 2011 accounted for 90 percent of all deaths (AIHW, 2013a). Chronic diseases can occur across all ages; however they are more common in older age groups and among those who live in regional and rural Australia (AIHW, 2013a; AIHW, 2011a). According to the National Health Survey most people aged 65 years and over reported having at least one long-term condition (Australian Bureau of Statistics [ABS], 2013a). Features common to most chronic disease include:

- A complex cause, with multiple factors leading to disease onset.
- A long development phase, often with no warning symptoms.
- A prolonged course of illness, sometimes leading to other complications.
- An association with functional impairment or disability (AIHW, 2011a).

The most common types of chronic disease include CVD, cancer and diabetes (AIHW, 2013a; WHO, 2014a). They are considered to be largely lifestyle related and highly preventable. There are specific risk factors that have been identified as contributors to the development of these diseases (AIHW, 2012). These include demographic, behavioural, biomedical, genetic and environmental factors. Some of these risk factors are non-modifiable, such as age, gender and ethnicity. However many can be avoided or modified such as excess weight, poor diet, physical inactivity, tobacco smoking and excess alcohol consumption (AIHW, 2011a; AIHW, 2012). These risk factors are common to major chronic diseases and together account for approximately one third of the chronic disease burden (National Health Priority Action Council [NHPAC], 2006). The Australasian data from the Global Burden of Disease study, published in 2012, stated dietary risks (11% of the total burden), obesity (9%) and smoking (8%) were the leading risk factors for chronic disease (Lim et al., 2012). People living in rural and remote areas tend to have higher levels of these disease risk factors and illness than their metropolitan counterparts (AIHW, 2013b). Although people often have a combination of risk factors, excess weight, particularly obesity, is a key risk factor that has been identified by the Department of Health [DoH], (2012) as a National Health Priority Area (NHPA), with the intention to increase public attention and focus health policy.

Just as the aetiology of chronic disease varies, so does the extent of effect on the community, with broad significant personal, social and economic impacts (DoH, 2012). Socially, chronic disease causes disability and subsequently a distinct challenge for the Australian health care system, or contributes to premature death (AIHW, 2011a). In 2008–2009, there were over 378,800 potentially preventable hospitalisations for chronic diseases (4.6% of all hospitalisations) (AIHW, 2013c). As a result, chronic disease is associated with high economic costs. Although there are not more recent figures, the total costs for health services associated with chronic disease was estimated for 2004–2005 to have been more than \$6.5 billion (AIHW, 2011a). In 2008–2009 CVD alone cost the health system \$7.74 billion, which is 10.4 percent of the total allocated health care expenditure in Australia (AIHW, 2013a). These cost estimates are conservative as not all costs can be allocated by disease, and/or cannot be estimated, such as the burden on carers, families, loss of income and productivity (AIHW, 2012). Because chronic diseases are more common with advancing age the burden will increase as the population ages (AIHW, 2013a; Leventhal, Weinman, Leventhal, & Phillips, 2008). The reduction of chronic disease and associated risk factors is one of the “biggest health challenges that Australia faces” (AIHW, 2013a, p.90). Therefore identifying efficient and effective ways to prevent and manage chronic disease is of paramount importance for the Australia community and health care system.

There has been an increasing recognition of the impact of chronic disease at local state and national levels, with an emphasis on promoting health and reducing health inequalities, particularly in relation to the prevention of chronic disease (AIHW, 2013a; AIHW, 2012). In recent years there have been a wide range of government and non-government programs in the area of chronic disease. These have focused on research and initiatives to identify best practice, increase access to appropriate care and support options with the goal of reducing the overall burden (AIHW, 2012). In 2005 the Australian National Chronic Disease Strategy was released (NHPAC, 2006), providing an overarching framework encouraging a coordinated approach to manage the growing impact of chronic disease. This Strategy identifies seven principles as follows:

- Principle One: Adopt a population health approach and reduce health inequalities
- Principle Two: Prioritise health promotion and illness prevention
- Principle Three: Achieve person centred care and optimise self-management
- Principle Four: Provide the most effective care
- Principle Five: Facilitate coordinated and integrated multidisciplinary care across services, settings and sectors
- Principle Six: Achieve significant and sustainable change

- Principle Seven: Monitor progress (NHPAC, 2006).

Of these seven principles, four key action areas were identified and have been the focus of “chronic disease prevention and care across the continuum” for the past ten years, namely:

1. Prevention across the continuum;
2. Early detection and early treatment;
3. Integration and continuity of prevention and care; and
4. Self-management (NHPAC, 2006, p.21).

In 2008 the National Preventative Health Taskforce (NPHT) was established. It later developed the National Preventative Health Strategy (NPHS) in 2009, which initially focused on three risk factor areas: obesity, tobacco and excessive alcohol consumption. These became the priority areas for the Australian National Preventive Health Agency (ANPHA), which was established in 2011. Furthermore the Council of Australian Governments (COAG) also identified the prevention of illness and injury as a focus area (DoH, 2011) and developed initiatives such as the Australian Better Health Initiative (ABHI)- a key element of which was supporting consumers in developing self-management skills related to their chronic diseases (Commonwealth of Australia, 2009; Department of Health, Western Australia [DoHWA], 2006). More recently, the government has consolidated its approach to prevention, by including the functions of the ANPHA into the DoH. This will reportedly increase the capacity of the health system to prevent and manage chronic diseases (ANPHA, 2014).

Despite these national frameworks and agencies, there is recognition that many of the states and territories have existing strategies related to chronic disease. In WA, current state policy documents related to chronic disease include the WA Chronic Health Conditions Framework 2011-2016 (DoHWA, 2011a), the WA Chronic Conditions Self-Management Strategic Framework 2011-2015 (DoHWA, 2011b) and the WA Health Promotion Strategic Framework 2012-2016 (DoHWA, 2012a). These policy documents have a strong preventive focus on targeting lifestyle risk factors, in particular obesity and related issues that contribute to the development of chronic disease in Australia. Chronic disease is a wide ranging issue that requires a comprehensive approach at all levels of government and non-government organisations to address its prevention, detection and management in Australia (NHPAC, 2006).

1.2.2 Obesity

The prevalence of overweight and obesity has been increasing for the last few decades. Obesity has been identified as a serious public health challenge and is the leading cause of

preventable death worldwide (WHO, 2007). Australia is one of the most overweight, developed countries in the world (National Health & Medical Research Council [NHMRC], 2013a; NPHT, 2009a). According to the ABS (2013b) in 2011-2012, 62.8 percent of Australians aged 18 years and over were overweight or obese (35.3% overweight and 27.5% obese), which is an increase from 56.3 percent in 1995. Although obesity affects people across the population, it is evident that differences exist among certain groups (NHMRC, 2013a). Men are more likely than women to be overweight and obese (69.7% compared to 55.7%) and those men living in inner regional, outer regional and remote areas of Australia are more likely to be overweight or obese than their metropolitan counterparts (74.4% compared to 67.7%) (ABS, 2013c). The likelihood of being obese is also influenced by the geographical location, with the incidence higher in rural and remote areas compared to urban areas (NHMRC, 2013a). The 2011–2013 Australian Health Survey, found that Australian men living in rural and remote areas were more likely to be overweight or obese (74%) compared with their metropolitan counterparts (68%) (AIHW, 2013b). Based on current trends, it is predicted that overweight and obesity figures will continue to increase. It is estimated that there will be 6.9 million obese Australians by 2025 and more than 3 million obese males (Access Economics, 2008).

Obesity is a condition in which excess body fat accumulates, causing a negative impact on an individual's health (WHO, 2000). Overweight and obesity can be defined in a number of ways, however Body Mass Index (BMI) is the most commonly used method and is calculated by dividing weight (kilograms) by height (metres) squared. This method is used to identify four categories: underweight, healthy, overweight and obese, with obesity defined as a BMI of 30 kg/m² or higher. This is distinguished from being overweight, which is defined as a BMI of between 25–29.9 kg/m² (AIHW, 2013a).

There are numerous factors that contribute to overweight and obesity. The causes are both simple and complex and include an interplay of biological, environmental and individual factors (NHMRC, 2013a; NPHT, 2009a). There are certain inherited biological factors that influence how some people regulate energy balance, which influences their risk of becoming obese (NHMRC, 2013a). Irrespective of the inherited factors the fundamental cause of obesity results from a chronic positive energy imbalance (Hobbs, 2008), therefore, the 'simple' way to prevent or reduce obesity is to decrease food (energy intake) and increase exercise (energy output) (NHMRC, 2013a). However, the physical environment influences the way individuals interact with services, education, work, social activities and food and can promote changes in dietary and exercise patterns (NHMRC, 2013a; Swinburn, 2008). Beyond the physical environment are laws, policies, cultural attitudes and values (Swinburn & Egger, 2002). According to Swinburn and Egger (2002, p.290) Australia has an "obesogenic" culture which encourages energy imbalances and contributes to the development of obesity (NPHT, 2009b).

Individual factors include lifestyle behaviours, psychological factors (e.g., depression) and physical factors (e.g., impaired mobility) (NHMRC, 2013a). Preventative health initiatives primarily focus on modifying individual lifestyles and habits to influence obesity reduction.

Obesity and related health problems cause significant economic burden to individuals, families and the community. Increasing levels of obesity among the Australian population will have significant implications on the health system and on the Australia community (NPHT, 2009a). The costs are widespread and include individual, social and economic impacts. According to WHO (2014), overweight and obesity are the leading risks for global death and most significant cause of poor health. In Australia in 2003, high body mass was responsible for 7.5 percent of burden of disease with 7.7 percent in males compared to 7.3 percent in females (AIHW, 2003a). According to the ABS (2009) in 2007-08, people who were overweight or obese were almost twice (1.9 times) as likely as people within the healthy BMI range to have Type 2 diabetes and 1.7 times as likely to have high blood pressure. As BMI increased, the risk of developing chronic disease correspondingly increased (WHO, 2014a). Obesity is also associated with a range of other conditions including mental health problems, sleep apnoea, reproductive and back problems (NPHT, 2009a). Although it is difficult to estimate the total cost of obesity, due to numerous associated indirect costs, in 2008 it was estimated that the total direct cost of obesity was \$8.3 billion, \$2 billion of which was the cost to the Australian health system. Overall costs were estimated at more than \$58.2 billion (Access Economics, 2008). It has been noted that this is more than likely an underestimate: most estimates do not include costs associated with people who are overweight, despite the increase health risk attributed to being overweight (Colagiuri et al., 2010).

Obesity prevalence rates are predicted to increase (Access Economics, 2008). According to these trends, addressing the continued increase in obesity rates is a major concern for the Australian health care system and the wider community. There has been increasing focus in international and national policy on reducing obesity. In response to the increasing burden of chronic disease and obesity at an international level, the WHO developed the Global Strategy on Diet, Physical Activity and Health (DPAS) (WHO, 2009) which recognised that stimulus for change in addressing obesity must come from political leadership and policy directions. The WHO (2000) has also highlighted the need for targeted prevention for high risk groups, particularly those with weight problems but who are not yet obese. Internationally, in recent years the National Institute for Health and Care Excellence (NICE) (2006), National Institutes of Health (NIH) (2000) and the Scottish Intercollegiate Guidelines Network (SIGN) (2010) published clinical practice guidelines to support the prevention and management of obesity.

In Australia, obesity has been highlighted as one of the NHPA, and will consequently attract funding to build on evidence, and enhance policy and practice in this area (NHMRC, 2012). The Australian government has developed strategic plans which focus on preventing overweight and obesity for the population and for specific subgroups (DoH, 2014a). To support these plans and to complement public health measures, the NHMRC (2013) produced national obesity guidelines. There are a number of government agencies that have focused on addressing obesity as a priority area, as discussed above in relation to preventing chronic disease (e.g., COAG, NPHT). In 2009 there was an inquiry into obesity in Australia, entitled *Weighing it up: Obesity in Australia*, that highlighted the implications of obesity and identified the roles of government, industry and the community in its prevention and management and made recommendation for action (Parliament of Australia, 2009). Despite this inquiry, there remains no national obesity framework or strategy in Australia.

There have been numerous preventive health campaigns aimed at obesity over the years for example, Measure Up, Get moving, Go for 2&5, Swap it, Don't stop it. More recently the Healthy Spaces and Places, the Collaboration of Community-based Obesity Prevention (CO-OPS) have targeted obesity in adults (DoH, 2014a). Furthermore, the Australian government has funded the Healthy Communities Initiatives, which support local governments in delivering community based programs. There is extensive private industry focus on reducing obesity and numerous weight loss programs including commercial weight loss programs (e.g., Jenny Craig, Gutbusters), weight loss products (e.g., meal replacements) and community-based weight management programs. Regardless of these actions, there remains a need for packaged interventions that are multifaceted and address those most at risk of becoming overweight or obese (NPHT, 2009a).

1.2.3 Rural Men's Health

In Australia, like many other developed countries, men fare worse than women on most health indices. They live an average of 4.4 years less (ABS, 2013b) and have disproportionately higher rates of morbidity and mortality in most of the major causes of disease and death (ABS, 2013d). In Australian men, many of the causes of premature death, including CVD, lung cancer and colorectal cancers, can be linked to lifestyle risk factors such as inactivity, poor diet, excess alcohol and smoking (AIHW, 2013d). Many risk factors for chronic illness remain particularly high among men, as does their level of risk taking behaviours (DoH, 2008). The highest proportion of total disease burden attributed to determinants of health in men in 2003 were tobacco smoking (9.6%), hypertension (7.8%),

overweight/obesity (7.7%), hypercholesteremia (6.6%), physical inactivity (6.4%) and alcohol (3.8%) (AIHW, 2008; DoH, 2008). These are all key risk factors for chronic disease. In particular, the incidence of overweight and obesity has increased markedly over the past two decades (ABS, 2013c). However, men are less likely to seek medical attention and be involved in their own health care (Buckley & Lower, 2002; Egger, 2000). In 2007-2008, Australian men accounted for only 43 percent of visits to general practitioners (AIHW, 2010). On the other hand, men accounted for just over half of presentations to hospital emergency departments (AIHW, 2013d), which may reflect delays in seeking medical attention. This can result in graver health outcomes and more intensive and costly interventions (Commonwealth of Australia, 2010a, 2010b).

In addition to individual behaviours that impact on men's health, it is also important to consider the influence of social, economic, and environmental factors (AIHW, 2010; du Plessis, Cronin, Corney, & Green, 2013). Inequalities exist between socioeconomic groups (Commonwealth of Australia, 2010a). There is evidence of differences between types of occupation groups, in particular, male blue-collar workers are considered to be disadvantaged. Blue-collar occupations, as defined by the Australian and New Zealand Standard Classification of Occupations (ANZSCO), are those who work as technicians and trades workers, machinery operators/drivers, and labourers, and account for approximately one third of the workforce (ABS, 2011a). Men make up the majority of the blue-collar workforce (ABS, 2011b) and according to Kolmet, Marino and Plummer (2006, p.82) "are considered to be at the bottom of the socioeconomic power gradient". They also have disproportionately poorer health outcomes, and higher rates of morbidity and mortality (ABS, 2011b; AIHW, 2010; Wilkinson, 2005). Blue-collar occupations are often associated with physical work, these physical demands have been linked to the "wear and tear" that men perceive on their health (du Plessis et al., 2013; Kolmet et al., 2006). However, blue-collar industries often operate under stressful conditions that are competitive, project-based and create expectations of long working hours, weekend work and an imbalance in the work-life equilibrium (du Plessis et al., 2013). Furthermore this environment, as discussed by du Plessis et al. (2013), creates a culture that inadvertently promotes risky lifestyle behaviours (e.g., poor diets and excessive alcohol consumption), traditional masculine characteristics and stoicism can lead to stigmas associated with health seeking behaviours.

In rural areas these problems are magnified, with research indicating large disparities in health status of rural men compared to those living in urban areas (AIHW, 2010; AIHW, 2011b). Rural and remote Australia includes those areas that are outside major cities and can be defined by a number of classification systems. The AIHW recommends the use of the ABS Australian Standard Geographic Classification (ASGC) Remoteness Areas (RA), which

allocates location in Australia to one of five categories including: major cities, inner regional, outer regional, remote, and very remote (ABS, 2014a; AIHW, 2013b). In 2012, more than one third (34%) of the Australian population resided outside major cities, with slightly more males, with approximately 3.86 million living in regional and remote areas (ABS, 2013e). The highest proportions of the men (compared to women) in rural Australia were aged in the 50-65 year age group. In contrast, the 20-35 year age groups had the lowest proportion of men living in rural areas: this can be attributed to the education and employment opportunities offered by cities that draw younger men away from rural areas (ABS, 2013e).

It is important to consider remoteness in health care as there remain inequalities in the Australian health care system, particularly in terms of accessibility to health services, with shortages of many health professional, health related infrastructure and service provision (AIHW, 2008). Men in rural areas often have limited access to health services, recreation and support facilities (AIHW, 2010) and are further disadvantaged in terms of education and employment opportunities (AIHW, 2008; National Rural Health Alliance [NRHA], 2013). Health issues may be compounded by long working hours, seasonal work requirements, privacy issues (i.e., knowing the health practitioner) and the geographical distances (AIHW, 2010). Furthermore, culture and beliefs also contribute to differences; for example, it has been reported that rural men believe that being physically big is an advantage and a sign of strength (O’Kane, Craig, Black, & Sutherland, 2008a). Self-reliance and reluctance to seek medical help has also been reported to contribute to poorer health outcomes (Commonwealth of Australia, 2010b; Begg, Barker, Stanley, & Lopez, 2008; Peerson & Saunders, 2011). This is a particular challenge, i.e., to change the perception that seeking help is not a weakness but a responsible action (Commonwealth of Australia, 2010b). In contrast to the disadvantages, people living in rural areas of Australia have reportedly higher levels of social cohesiveness (AIHW, 2013a), which may increase the level of social support available, build resilience and assist men to cope.

In recognition of the inequalities in men’s health and particularly for men residing in regional and remote Australia, there have been numerous policies and considerable research in this field in recent times. In 2010 the Australia Government released the National Male Health Policy, which was designed to provide a framework for improving men’s health across Australia (Commonwealth of Australia, 2010c). The inequalities of men in rural and remote Australia are identified as a key focus of the Policy. Within the Policy, six key priority areas were identified:

- Priority 1-Optimal health outcomes for males
- Priority 2-Health equity between population groups of males

- Priority 3-Improved health for males at difference life stages
- Priority 4-A focus on preventive health for males, particularly regarding chronic disease and injury
- Priority 5-Building a strong evidence base on male health and using it to inform policies, programs and initiatives
- Priority 6-Improved access to health care for males through initiatives and tailored healthcare services, particularly for male population groups at risk of poor health (Commonwealth of Australia, 2010c).

In 2008, a total of \$16.7 million, over four years was invested by the Australia Government in male health programs that were designed to support the priority areas (DoH, 2014b). To address the need for strong evidence related to male health in Australia (Priority Area 5), \$6.9 million was allocated for a national longitudinal study on male health, also known as the *Ten to Men Study*, funding was provided for a series of statistical bulletins by AIHW (DoH, 2014b). The *Ten to Men Study* led by the University of Melbourne, is following approximately 16,000 Australian males aged between 10 to 55 years. The participants will be monitored every two to three years either by face-to-face interviews (boys aged 10-14 years) or self-report questionnaires (all other age groups) (English et al., 2014). No data are currently available; however, the study aims to generate valuable information that will inform government policy, consumers and program development in male health.

There are at least three Australian states (Victoria, New South Wales and South Australia) that have developed their own men's health strategies or action plans (Department of Health Victoria [DoHV], 2010a; New South Wales Department of Health, 2009; South Australian Department of Health, 2008). In WA, there is currently no specific policy to address men's health in general; yet there is an Aboriginal Men's Health Strategy 2012-2015, which is designed to provide guidance to improve the health of Aboriginal men (DoHWA, 2012b). There are, however, a number of regionally focused initiatives in WA that target men's health. For example, The Regional Men's Health Initiative, which received funding via Royalties for Regions to expand from delivering services in the Wheatbelt region to across rural WA. Numerous other men's health agencies across rural and remote WA, such as Midwest Men's Health, Men's Outreach Service, Men's Advisory Network (MAN), Men's Resource Centre, The Mate's Men's Support Group, WA Men's Health and Men's Time. A number of initiatives specifically targeting men are led by the WA Country Health Service [WACHS] that include the Pitstop Program: a mobile health check program that is delivered throughout WA. This is set up as a series of stations, each involving a quick, simple health check using the analogy of vehicle maintenance (DoHWA, 2014). Despite the recent attention

towards rural men's health in Australia, large disparities in health continue and there is a need for male focused interventions that are objectively measured and articulated. Furthermore, the social, environmental and economic disadvantages, combined with the higher prevalence of risk taking behaviours emphasise the need for research, policy, evidence based practice and interventions that focuses on improving the health of men living in rural Australia (AIHW, 2010).

1.2.4 Workplace Health Promotion

Raising awareness is an important element in improving men's health. However, health promotion aimed at men is often difficult (Egger, 2000) and does not reach all sectors, often missing those who need it the most (Buckley & O'Tuama, 2010). Worksites or workplaces (the terms are used interchangeably) are identified as a suitable place for health education and promotion (Aoun & Johnson, 2002a, 2002b; Aoun, Donovan, Johnson, & Egger, 2002; Commonwealth of Australia, 2014) and identified as a priority setting by the WHO (2014b).

Over 11 million Australians are in paid employment, with approximately three quarter, or eight million in full time employment (ABS, 2014b). In 2010-11 more males than females worked full time (84% compared to 54%) (ABS, 2012a). Most of these men spent more than half of their waking hours in the workplace with more than a third (37%) of employed males working between 35 and 44 hours per week, a further 31 percent working 45 hours or more per week (ABS, 2012a).

Given the duration of time spent at work, there is little doubt that the workplace environment has a significant impact on the health of individuals. A range of workplace determinants including, physical environment, organisational structure, culture and work roles are considered to impact on the health of employees (Government of Tasmania, n.d.). Australian data suggests that male dominated industries such as agriculture, forestry and fishing have some of the highest incidences of work related injury (128 per 1000 employed men) and death rates (ABS, 2008). Data on the forestry sectors indicate that this population already have risk factors for chronic disease at younger ages compared to the national average (Centre for Human Factors and Ergonomic [COHFE], 2001; ForestWorks, Industry Skills Council, 2009). According to an analysis undertaken by PriceWaterhouseCoopers in 2010 using data from the 2007/2008 National Health Survey combined with industry data, the forestry workforce, which is grouped with agriculture and fishing, had a high prevalence of some modifiable lifestyle risk factors, particularly BMI and waist circumferences (Table 1.1) (DoH, 2013a; PricewaterhouseCoopers, 2010). The workplace setting has the ability to

influence negative lifestyle habits such as poor diet and activity patterns, which can contribute to obesity and associated ill health (NPHT, 2009a). The direct and indirect costs to the community are considerable. Although it is difficult to estimate the social cost, the implications for employers relate to absenteeism, increased presenteeism, loss of productivity and morale, and increased work injuries and fatalities (ABS, 2011b; Commonwealth of Australia, 2010d; Safe Work Australia, 2012). According to Safe Work Australia (2012) the total economic cost to the Australian economy for illness and injury for the 2005–06 financial year was estimated to be \$57.5 billion, representing 5.9 percent of GDP with the estimated cost to employers approximately 18 percent (\$10.2 billion).

Table 1.1. Prevalence of modifiable lifestyle risk factors, nationally compared to forestry, agriculture and fishing

Analysis of all Persons aged 18 or more	Current Smoker	Inadequate Fruit & Vegetable Intake	Physical Inactivity	BMI - Measured		Waist Circumference		Alcohol Increased Lifetime Risk
				Overweight OR obese	Obese	Increased OR high risk	High Risk	
National	22%	49%	71%	59%	23%	55%	31%	24%
Agriculture, forestry and fishing	20%	40%	70%	64%	26%	63%	47%	30%

Source: Adapted from DoH (2013b). *Healthier workers initiative: How healthy is your industry? Agriculture, forestry and fishing*. Retrieved from: <http://www.healthyworkers.gov.au/internet/hwi/publishing.nsf/Content/industry-agriculture>

Improving the health of employees offers benefits that are wide ranging and considered to increase with time (Goetzel & Ozminkowski, 2008; Robroek, van den Berg, Plat, & Burdof, 2011; WHO, 2014b). Employers and employees gain a measurable return for example decreased absenteeism, reduced staff turnover and increased productivity. Less tangible benefits such as, increased engagement, team work, moral, and improved job satisfaction have also been identified in workplaces which have implemented health promotion activities (WHO, 2014b). International literature suggests that health and wellbeing programs benefit across all sectors, regardless of the size of the organisation, and therefore, it has been said that “good health is good business” (Black, 2008, p. 54).

There is growing recognition globally of the scope of preventative health initiatives delivered through the workplace (Commonwealth of Australia, 2010d; WHO, 2014b). The workplace can be used to complement and reinforce health messages that are delivered in the community (Commonwealth of Australia, 2010c). Furthermore, the setting can be useful to reach groups which are often difficult to engage in programs delivered through the health system, for various reasons. As highlighted by the Commonwealth of Australia (2010c), lack

of time, full-time work and other work related commitments are considered key barriers for many men in accessing health services; workplace health initiatives are an effective way to overcome many of these barriers. Worksites traditionally employ large numbers of men and have a captive group in which formal and informal communication and support networks are already established (NPHP, 2003). The culture in workplaces, such as having participants already known to each other, camaraderie and competition, can be used as a health strategy to encourage participation and achieve more positive health outcomes (Aoun & Johnson, 2002a, 2002b; Commonwealth of Australia, 2010d; NPHP, 2003).

The increase prevalence of obesity and associated chronic diseases are putting pressure on an already challenged health care system (AIHW, 2013a). No one country has been able to halt the increase in rates of obesity and chronic disease, and accordingly, rates continue to rise (Swinburn, 2008). Consequently, escalations in health care costs are predicted to continue (NPHT, 2009a), increasing the need for innovative ways to engage people in health and share the costs among the community. The NPHT (2009a) suggested that prevention is the responsibility of everyone. To achieve a halt and reverse the rise in obesity, as per the goal for Australian Health 2020, and sustain reductions in the incidence of chronic disease with long-term improvement in health, there is a need for a system that is focused on prevention and has a coordinated, responsive and partnership approach (DoHV, 2011a; NPHT, 2009a). This will require stronger strategic partnerships across the three tiers of government, non-government organisations, industries, and individuals (NPHT, 2009a). Creating a strong partnership approach that shares the responsibility of health, resources and information is necessary to meet the future challenges faced by the health system (DoHV, 2011a; NPHT, 2009a). Involving industry in health produces a four-fold benefit to the employer, the employee, the wider community, and health system.

There have been many work place health programs implemented in Australia and across the world; however, few have been thoroughly evaluated (NPHP, 2003). Furthermore, initiatives are described as ad hoc, and each state or territory have their own approaches with little national coordination (NPHP, 2003). Many reported workplace health initiatives have been implemented in large scale businesses, or the public sector, which generally have access to human resources staff to deliver such programs. It has been suggested that men in industries which are often small to medium scale businesses and typically employ more than 80 percent of Australians, are associated with the highest risk factors for ill health, highest incidences of chronic disease, and generally poorest health outcomes. It is recommended that these should be the groups that health initiatives are designed to target (Commonwealth of Australia, 2010d). However, developing sustainable programs that address the needs of the employees and employers, which can be effectively delivered in an environment where there are fewer

staff, lower turnover, smaller profit margins and no dedicated human resource staff, present a major challenge for the health system (Black, 2008). This challenge is compounded in rural areas.

Implementing workplace initiatives is challenging and complex (Commonwealth of Australia, 2010d). Although worksites are ideal places to implement interventions, as there are advantages to having on-site, convenient programs, there are well-known barriers to successful work-based programs. Limitations include adequate support from organisations and management, and changing company agendas and priorities. According to the NPHP (2003), until programs become entrenched in the culture of the company, they can be subject to limited, short-term support. Other potential problems reported include low levels of participation and poor adherence rates (NPHP, 2003). For programs to be successful they must be accepted, adopted and supported by organisations and employees. They also need to have the support of unions, function consistent with the local and state government agenda and work in close collaboration with the community and occupational health and safety agencies (Commonwealth of Australia, 2010d; NPHT, 2009a).

Workplace health promotion is gaining momentum internationally with government, non-government agencies and private industry endorsing or introducing health related initiatives across all sectors (Anderson et al., 2009; Black 2008; Commonwealth of Australia, 2010d; WHO, 2014b). Moreover, health promotion in workplace settings has been recommended by international bodies through numerous charters and declarations (DoHV, 2011b; WHO, 2009). The WHO (2009) clearly identified workplaces as key setting for health promotion in their Global Strategy DPAS. They produced a report focusing on the effectiveness of interventions targeting diet and physical activity across various settings, including the workplace (Engbers, 2008). Furthermore, the Western Pacific and European Offices of WHO have developed effective healthy work programmes that focus on primary prevention, particularly through targeting lifestyle factors (WHO, 2007; WHO, 2014b).

At a national level, there is commitment to reduce the risk factors for chronic disease by entrenching healthy behaviours in workplace settings. There is a focus on developing national best practice frameworks and strengthening national action research to broaden the evidence of effective workplace health promotion programs in the Australian context (DoH, 2013b). This is evident in government schemes, COAG, the National Partnership Agreement on Preventive Health and the NPHA. Likewise, there has been financial commitment from the government, including funding for the Healthy Workers initiative, of \$294.3 million to states and territories over seven years (DoH, 2013b; DoHV, 2011b). Additionally, agencies such as Worksafe are working with workplaces to develop and implement programs, policies

and practice that promote healthy lifestyles (Healthier Work, 2012). At a local level there are many local governments, health organisations and private industries independently implementing health initiatives in workplaces. Despite the well-documented advantages of workplace health initiatives, and the strong level of support for them internationally and in Australia, there remains a lack of high quality evidence of what works in individual organisations (Bellew, 2008; DoHV, 2011b; Hooper & Bull, 2009).

1.2.5 Self-Management

Despite the increasing pervasiveness and overwhelming impact on the health care system, until recently health service provision was orientated to acute conditions and managing, rather than preventing, chronic disease: particularly in men (NHPAC, 2006). Prevention and lifestyle modification can assist the healthy population, those at risk and those already with evidence of disease (NHPAC, 2006). Internationally and nationally there has been some progress towards preventing chronic disease. There are a number of previous and existing government strategies aimed at chronic disease, obesity and men's health. All have a strong focus on promoting good health and addressing the impact of chronic disease through prevention and management. Self-management has been highlighted in each approach, including the National Chronic Disease Strategy, the National Men's Health Policy, the WA Chronic Disease Strategy (Commonwealth of Australia, 2010c; NHPAC, 2006; DoHWA, 2011a; DoHWA, 2011b).

Self-management initiatives have been highlighted as key methods in enhancing self-care and prevention of chronic disease; therefore, they are a strong focus of many of the health policies in this area (DoHWA, 2006; DoHWA, 2011b). Self-management in the National Chronic Disease Strategy is defined as "the active participation by people in their own health care" (NHPAC, 2006, p.37). These programs are designed to teach problem solving skills, allowing individuals to identify their problems and, provide techniques to assist them in making decisions and take action for their own health and facilitate adoption of health behaviours (Bohemeimer, Lorig, Holman, & Grumbach, 2002; Wasri, Wang, LaValley, Avorn, & Solomon, 2004). There are a number of approaches that have been used to develop and support self-management. Some approaches include peer based support, mentoring, telephone counselling and internet base resources (NHPAC, 2006). There are several well-known models of self-management. The main ones include the Flinders Model, which is a clinician led model that integrates self-management with medical management, and the peer led Stanford Model also called the Lorig Model, which encourages learning through peer support and collective problem solving (DoHV, n.d.). These models do not function

independently of one another, but rather work in synergy and complement each other. The main criticism is that the uptake is often poor and most whom enrol are women (Osborne & Newell, 2003). This was supported in The National Chronic Disease Strategy, which recognised the need to develop models of self-management that are appealing to men (NHPAC, 2006).

1.2.5.1 The ‘Waist’ Disposal Model of Self-Management

The past two decades have witnessed a wealth of research demonstrating the efficacy of various self-management interventions for people with many different chronic conditions including hypertension, arthritis and diabetes (Nolte & Osborne, 2013; Jordan & Osborne, 2007; Wasi et al., 2004). However, there is a lack of self-management interventions targeted at the community level, particularly for men at risk of chronic disease. Aoun, Shadid, Le, and Holloway (2013a), with their *Rotary ‘Waist’ Disposal Challenge* project, demonstrated that a specific health intervention is acceptable to a male cohort in a rural area. Rotary International is an organisation of service (Rotary) clubs. These clubs are located across the world and are open to all persons, although membership consists mainly of business and professional leaders and is historically dominated by men. There are approximately 1.2 million members and 32,000 clubs internationally (Rotary International, 2014). In Australia there are 11,000 clubs with more than 30,000 members who typically meet weekly, with the main focus of providing a charitable service (Rotary Australia, 2014).

The conceptual design of *The Rotary ‘Waist’ Disposal Challenge* was based on the Transtheoretical Model (TTM), which explains the five different stages of change that are common to most behaviour change, these being pre-contemplation, contemplation, preparation, action and maintenance. The multiphase project was designed to deliver health benefits in three phases, to meet the needs of participants at different stages of adopting lifestyle behaviour change. Phase One consisted of the delivery of educational presentations, by lay health advisors, who were known as ‘Champions’. The education provided focused on nutrition, exercise and other healthy lifestyle habits to raise awareness of lifestyle risk factors for chronic diseases and the benefits of a healthy diet and physical activity. Phase Two consisted of a BMI Challenge between clubs, facilitated by club Champions. Rotarians with BMI figures of 25kg/m² and above participated at this level. Competition between clubs (monthly weigh-ins) acted as an incentive; the club that achieved the largest mean reduction in BMI was awarded the *‘Waist’ Disposal Trophy*.

The third and final phase was an individual and personalised telephone Lifestyle Coaching Programme (LCP) with regular follow-up (Aoun, Osseiran-Moisson, Shahid, Howat, & O'Connor, 2012). Lifestyle or health coaching is widely supported in the literature. It is the practice in which health professionals apply evidence-based psychological counselling, coaching principles and techniques to assist individuals in achieving positive health and lifestyle outcomes through cognitive and behaviour change (Health Coaching Australia, 2008). Health coaching is typically conducted in the context of health behaviour change for disease prevention and/or chronic condition self-management. It can be delivered face-to-face, by telephone or email (Health Coaching Australia, 2008; Lorig, Ritter, Laurent, & Plant, 2006). 'Telephone care', more commonly known as telehealth, in particular, has been used as an effective way to fill gaps in health services by allowing on-going follow-up this is of benefit in rural areas where access to health professionals is limited (Piette, 2005). Lifestyle coaching is reported as an effective strategy for reducing disease risk factors (Vale et al., 2003). It also has potential to be effective in helping men in rural areas adopt a healthy lifestyle and achieve outcomes such as weight loss and increased activity levels. Lifestyle coaching was therefore, adopted as the final phase of the intervention.

The programme was designed to move participants through the five stages of behaviour change and applied strategies appropriate for each phase (Aoun, Osseiran-Moisson et al., 2009). The education phase was designed to raise awareness of health issues and foster recognition of the benefits of change, particularly for those with no intention of changing lifestyle habits. The BMI competition was focused on supporting participants from thinking of change to being ready or actioning change as a group. Finally, the individualised lifestyle coaching phase was used to help participants into identifying barriers to change and determine an action plan for change.

The model was first piloted in 2006 with five Rotary Clubs and 135 members. The project was then delivered to 23 Rotary Clubs in WA in 2007- 2008; a total of 687 men participated in phase one of the study. Ninety percent of club members were male; the average age was 57 years. Fourteen (60%) of the participating clubs were in rural areas (Aoun, Osseiran-Moisson et al., 2009). The model was further tested in a project that focused on training the Champions, who were Rotary Club members, to deliver phases one and two of the program between June 2009 and May 2010. Fifty-two clubs participated in the programme and 93 Champions were trained to build capacity from within the clubs. The Champions delivered education to 1300 peers in 52 clubs and facilitated the BMI competition for 764 peers in 36 clubs for a period of 18 months. A brief one-day training programme was developed to suit club Champions (Aoun et al., 2013a).

Findings for each of the projects using the multiphase '*Waist*' *Disposal Model*, demonstrated positive changes in health behaviour and consequently biophysical changes to weight and waist measurements (Aoun, Osseiran-Moisson et al., 2009; Aoun et al., 2012). For example in the first six months of the BMI competition, Rotary clubs had an average of 1.07 percent decrease in their BMI ($p = 0.005$). Throughout the total 18-month period, 16 clubs showed significant reductions in BMI ($p < 0.01$), with another 17 clubs showing BMI reductions that did not reach statistical significance: only three clubs had a slight increase in mean BMI. There were improvements noted in dietary intake, physical activity, improved quality of life and self-reported wellbeing (Aoun, Osseiran-Moisson, Shahid, Howat, & O'Connor, 2013b). However such changes were dependent on the level of readiness for change. Therefore, models of change in health behaviour offer some insight into how interventions should be targeted (Aoun, Osseiran-Moisson et al., 2009). The team which developed *The Rotary 'Waist' Disposal Challenge* project recommended that this model be trialled in workplaces to test if the intervention was appropriate for other settings, mainly those dominated by men. Hence, the self-management program developed and implemented by Aoun, Osseiran-Moisson et al. (2009) in Rotary clubs in WA was replicated for men working in forestry industries in the Great Southern region of WA. A particular focus of this project was to test how the conceptual model, designed for *The Rotary 'Waist' Disposal Challenge* project would assist men in worksites to move through the stages of behaviour change to achieve positive health outcomes.

1.3 Research Objectives

This study implemented *The 'Waist' Disposal Model* in industry worksites in regional WA. The model is a health intervention aimed at reducing BMI as the primary outcome. Other outcomes include choosing a healthy diet, taking up regular exercise and adopting other lifestyle factors such as reducing smoking and alcohol intake to help in preventing chronic diseases. This study applied a mixed method, time series design and had three research objectives:

1. To assess the feasibility of undertaking this workplace intervention from the participant and organisation perspective.
2. To assess the impact of this intervention on improving lifestyle behaviours primarily in terms of nutrition, physical activity and reducing weight, taking into consideration the attributes, barriers and motivators that influence men's health related practices.

3. To assess the impact of this intervention on the stages of behavioural change, taking into consideration the attributes, barriers and motivators that influence men towards achieving a healthier lifestyle.

1.4 Significance of Study

Chronic diseases are conditions of great concern because of the significant burden they place on individuals, communities and health services (AIHW, 2013c). Many chronic diseases are highly preventable and prevention is, therefore, a high priority. Gender inequalities in health continue to be a major concern and men employed in blue-collar industries, particularly in rural Australia, are at an increased risk of developing chronic diseases (AIHW, 2010; AIHW, 2013a). This study focused on delivering a multiphase self-management program in blue-collar workplaces in regional WA with the view to share health responsibility, promote community ownership and improve sustainability. Few projects in chronic disease management target at-risk populations in the community, and specifically workplaces. The prevention of chronic disease has been recognised as the key to reversing current trends. The potential of this initiative to prevent, or delay, the onset of chronic disease and save in health care costs cannot be underestimated. This study adds to the body of knowledge relating to men's health behaviour and how they respond to workplace health promotion. In times of rising health care costs, directing health care expenditure carefully is more important than ever. This project aimed to encourage industry to take greater care of the associated workforce and implement an intervention that is tailored to their individual needs. This study also responds directly to the government and key health organisations imperatives to find innovative approaches to the prevention of chronic disease, particularly in difficult to reach populations. It addresses many of the priority areas that are identified in the national and state policy documents relating to rural men's health. It is anticipated that the findings from this study will inform other blue-collar industries to plan and deliver future rural workplace health initiatives.

1.5 Summary of the Background and Significance

This chapter has presented the background for this study. It has highlighted the significance of chronic disease and obesity, particularly for men in rural Australia. It was emphasised that as the incidence of obesity continues to increase and the cost of health care rises, there will be a need for individuals and private organisations to share the responsibility of promoting health and finding innovative ways to get people to adopt and maintain healthy lifestyles. Many of the government policies and strategies to target these issues have been presented, and self-management initiatives have been recognised as a key approach in

reducing risk factors for chronic disease. The workplace has been identified as an appropriate setting to deliver self-management initiatives; and *The 'Waist' Disposal Model* worth trialling in these settings. The following chapters will present a review of the literature, followed by detailed description of the mixed method study used to test the feasibility of a multiphase self-management intervention targeting rural men working in the forestry sector.

Chapter Two

Literature Review

2.1 Introduction

This chapter presents a focused review of the literature relevant to the areas of chronic disease self-management and workplace health promotion for men in rural areas. The literature of each of these areas is broad ranging and extensive and therefore specific search parameters were established. The chapter will be presented under two main topic areas. Firstly, literature relevant to rural men's health will be discussed, followed by a review of interventions focused on obesity prevention. Research into workplace health initiatives will be presented, including interventions that apply self-management and theory based approaches. Finally, the chapter will present a discussion of the key gaps identified in the literature which justify the need for this project.

2.2 Search Strategy

A review was undertaken of mixed qualitative and quantitative literature using the databases of CINAHL, Medline, PsychINFO and the Cochrane Library. The initial search was undertaken in 2009 and updated in November 2014- January 2015. Relevant search terms were developed using a combination of key words and Mesh-terms, which are documented in Table 2.1. Grey literature was identified pragmatically by using reference lists of related articles, dissertations, government reports and web searches from government departments and health associations. Relevant texts were also reviewed.

Table 2.1. Search terms

Champions/ lay health advisors(ers)/ lay leaders/ natural helper
Health promotion/health education/ health prevention
Men's health/ male health/ gender health
Nutrition/ nutrition behaviour/ dietary behaviour
Obesity/obese/overweight/ Body Mass Index/ BMI
Physical activity/ exercise/exercising/ fitness
Rural health
Transtheoretical model/ stage of change/stage-based/ stage transitions
Weight loss/ dieting

Worksite/ workplace/ employee health/ worker health/ occupational health intervention/ workplace health intervention/ workplace program evaluation

Given the scope of literature relevant to chronic disease self-management, men's health and workplace health promotion, the search was narrowed using inclusion and exclusion criteria as illustrated in Table 2.2.

Table 2.2. Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Time period	2000-Janurary 2015	
Language	English	
Place of study	International- First world countries	Third world/ developing countries
Intervention	Lifestyle related	Pharmacological/ surgical therapy
Gender	Relevant to men's health	No relevance to men's health
Age	Relevant to people aged 18-65 years	Paediatric and older people
Peer reviewed publication	Evidence Levels I-V	Editorial/ comment/opinion pieces

Figure 2.1 summarises the selection process. A total of 684 non-duplicate papers were reviewed thoroughly, with 67 papers being selected for inclusion in this review. To assist with the consistency of evaluating quality, the NHMRC guidelines for reviewing evidence were followed and the NHMRC levels of evidence applied (NHMRC, 2009a). Although the review aimed to focus on literature specifically examining men, it was evident that much of the literature was not gender specific; therefore, the literature review was expanded to include both males and females, as deemed appropriate. The NHMRC encourages the use of rigorous quantitative designs, however there are some sections in this review where a more narrative, qualitative approach was necessary (referred to as evidence level V), therefore, a mixture of quantitative and qualitative research is presented. A summary of the key papers presented in this review is provided in Table 2.3.

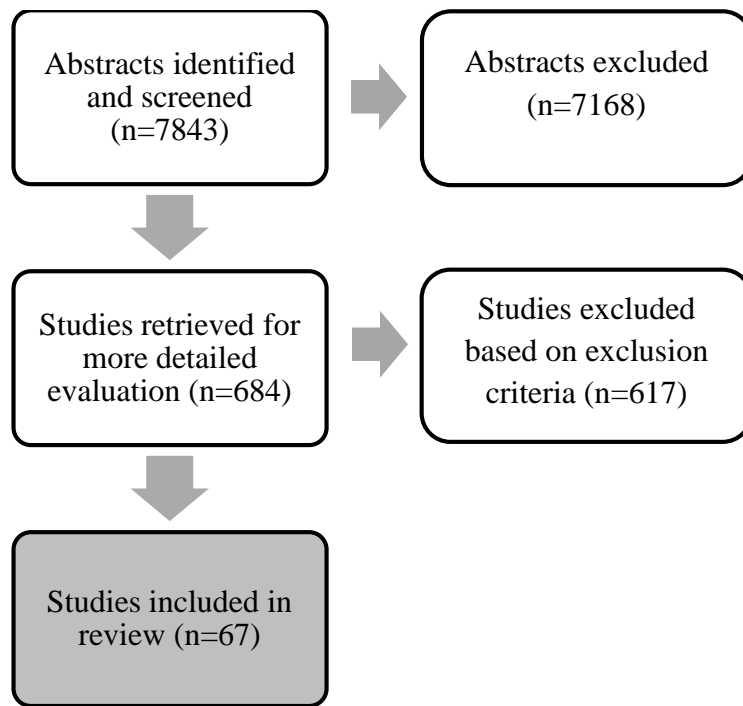


Figure 2.1. Results of literature search

The literature identified focused on two key topics, with a number of subtopics. The following topics will be the focus of this review:

- Improving rural men’s health
 - Barriers
 - Motivators
- Health interventions to address obesity
 - Health intervention components
 - Effectiveness of workplace interventions
 - Targeting weight loss
 - Targeting physical activity
 - Targeting dietary behaviours
 - Effectiveness of stage-based interventions
 - Effectiveness of self-management interventions addressing obesity.

Table 2.3. Summary of the literature reviewed

Reference & Country	Purpose	Method/Design	Sample	Findings	Comments/Relevance	Level of Evidence
Abraham & Graham-Rowe (2009). United Kingdom	To conduct a systematic review and random effects, meta-analysis assessed the effectiveness of worksite interventions to enhance physical activity.	Systematic review and meta-analysis 1997-2007	<ul style="list-style-type: none"> • 37 interventions reporting 55 unique interventions worksite interventions • Inclusion: 1) worksite intervention designed to increase PA, exercise or fitness; 2) participants free from pre-existing medical conditions 3) employed a RCT or quasi-experimental design; 4) outcome measure of PA or physical fitness. 	<p>Worksite interventions have small, positive effects on physical activity and this effect is smaller when fitness, as opposed to self-report, outcome measures are reported (0.15 versus 0.23).</p> <p>Interventions providing individually tailored information or instructions were not found to be more effective, but there was evidence that specific goal setting and goal review techniques may enhance fitness gains.</p>	<ul style="list-style-type: none"> • Recommendation of 1) target physical activity only; 2) prompt specific goal setting; 3) graded tasks and/or review of pre-set goals in the intervention design; and 4) consider focusing on walking or step counting. • Relevance- goal setting is effective 	I
Adams & White (2003). United Kingdom	To review and assess if TTM based activity promotion interventions have an additional effect over non-stage based interventions.	Systematic review 1982-2001	<ul style="list-style-type: none"> • 26 papers documenting 16 interventions. • Inclusion: 1) Adults > 16 years in the community 2) Intervention based on TTM, 	<p>7 applied TTM based counselling, 4 applied TTM based written material, 5 used mixture. Short-term 73% reported significant benefit of stage-based interventions over controlled conditions.</p> <p>Long-term effectiveness of stage-based interventions unclear.</p> <p>Subjects primarily white, middle class, female</p>	<ul style="list-style-type: none"> • Long-term effect define > 6 months • Recommendation for future work that innovative strategies to recruit and retain candidates who are hard to reach e.g., men, those in the pre-contemplation stage of activity change 	I

			3) Outcome measure PA			
Anderson et al. (2009). United States	To assess the effectiveness of worksite nutrition and physical activity programs to promote healthy weight among employees	Systematic review Workplace interviews targeting diet, physical activity, or both; employees and provide data on at least one weight related outcome measured at least 6 months from the start of the intervention program.	<ul style="list-style-type: none"> • 47 studies • ≥ 18 years (no retirees) • Applicable to both male and female employees, across a range of worksite settings. • Inclusion: <ol style="list-style-type: none"> 1) worksite health promotion involving diet, PA or both; 2) adult employees aged >18 years 3) weight related outcome measured > 6 months 	Found that worksite nutrition and physical activity programs achieve modest improvements in employee weight status at the 6–12-month follow-up. A pooled effect estimate of 2.8 pounds (95% CI 4.6, 1.0) was found based on nine RCTs, and a decrease in BMI of 0.5 (95% CI 0.8, 0.2) was found based on six RCTs. Most of the studies combined informational and behavioural strategies to influence diet and physical activity; fewer studies modified the work environment (e.g., cafeteria, exercise facilities) to promote healthy choices.	<ul style="list-style-type: none"> • Implementation barriers, cost and cost effectiveness of interventions also discussed. • Minimal demographic information provided- limits generalisability • Targeted at employees of any weight status (i.e., normal weight, overweight, or obese), with or without identified risk factors. 	I
Aoun & Johnson (2002b). Australia	To address the challenge of encouraging preventive use of health services among rural men by taking health education and screening to the workplace.	Mixed method Quasi-experimental design Phase 1- Education and screening Phase 2- Follow-up Phase 3- Focus groups	<ul style="list-style-type: none"> • 7 industries in rural WA • n=525 men 	Successfully engaged men in preventative health 27 sessions were conducted for 27 businesses, 64% at high risk of diabetes- 62% overweight and 33% with hypertension. 75% reported session increases awareness about consequence of diabetes. Of those who identified factors inhibiting them from attending a GP, 12% gave multiple reasons. The most frequent factor preventing men from visiting a GP when they have a health problem was that they think their problem is not serious enough.	<ul style="list-style-type: none"> • WA rural industry specific • Suggested strategies to engage rural men in preventative health • Highlighted issues associated with men's health help seeking behaviours • Suggested the need for partnerships between industry and health services 	IV

				<p>Motivation was not related to whether they visited their doctor or not, and regardless of their level of motivation to improve their health, seeking health advice was strictly to determine the presence or absence of disease.</p> <p>76% of those at-risk visited their GP and hence the strategy adopted has been appropriate in engaging men in the preventive concept of seeking care that is, getting them to attend their GP when they only have the risk factors but not the disease.</p>		
<p>Aoun et al. (2013b).</p> <p>Australia</p>	<p>To explore the feasibility of training and implementing LHA-based health promotion intervention, named the 'Waist' Disposal Challenge that involved middle aged to older men at a service club setting.</p>	<p>Mixed method Evaluation of the Champion training programme by Champions; evaluation of the Champions' delivery of the educational.</p>	<ul style="list-style-type: none"> • n=93 Champions from 52 Rotary Clubs (70% male, 75% rural areas) • Mean age 57 years 	<p>Champions reported significant improvements in their knowledge and confidence to motivate their peers to make changes to their diet and physical activity. 58% experienced and sustained a BMI reduction for 12 months. Clubs achieved 1.07% decrease in BMI ($p=0.005$).</p>	<ul style="list-style-type: none"> • Champions were successfully used to implement health intervention targeting obesity for men. • Relevant to rural WA 	IV
<p>Belanger- Gravel et al. (2011).</p> <p>Canada</p>	<p>To investigate the long-term effectiveness of theory-based interventions to increase physical activity participation among overweight/obese adults and identify</p>	<p>Systematic review 1980-2008</p>	<ul style="list-style-type: none"> • 23 studies describing 18 interventions • Well educated, healthy participants and mostly women 	<p>3 had significant short-term 2 long-term effects of interventions on physical activity participation. Most of the studies observed a significant short- or long-term effect of time on physical activity. Theoretical frameworks most often applied included the Behavioural Model and the Social Learning/Cognitive Theory. However, few of the studies reported any impact on theoretical variables.</p>	<ul style="list-style-type: none"> • Long-term impact of theory-based interventions unclear 	I

	potential intervention components that might prove most effective.					
Benedict & Arterburn (2008). United States	To update previous systematic review of effectiveness of worksite based weight loss programs.	Systematic review-1995-2006 Duration of intervention >8 weeks	<ul style="list-style-type: none"> • 7 RCTs, 2 nonrandomised trials, 2 uncontrolled case series. • n=111 employees from 55 organisations • Variety of settings and countries and workforces 	Most multicomponent interventions, focusing on education and counselling to improve diet and physical activity. Sample size varied from 37-453. Mean age 32-52 years. Follow-up 2-18 months Completion rate 56-100% Mean difference in weight loss between IG and CG ranged -0.2 to-6.4 kg.	<ul style="list-style-type: none"> • Methodological quality poor • Studies are mostly of short duration 	I
Blackford et al. (2013). Australia	To identify barriers to and enablers of physical activity and nutrition as well as intervention strategies for health promotion in office-based workplaces.	Cohort Online survey	<ul style="list-style-type: none"> • n=137 • Male and female • Metropolitan sample although WA 	Factors that affected physical activity and nutrition behaviours, included "too tired" and "access to unhealthy food" and enablers "enjoy physical activity" and "nutrition knowledge". Intervention-strategy preferences demonstrated employee support for health promotion in the workplace.	<ul style="list-style-type: none"> • Relevant to WA 	IV
Bosch-Capblanch et al. (2007). Switzerland	To assess the effects of contracts between patients and healthcare practitioners on patients' adherence to treatment, prevention and	Systematic review 1966-2004	<ul style="list-style-type: none"> • 30 trials with 4691 participants. Only 3 focused on weight control. 	15 reported statistically significant differences in contract groups. Concluded that contracts can increase adherence to treatment or preventative health regimes.	<ul style="list-style-type: none"> • Long-term effect unclear • Few studies on weight control 	I

	health promotion activities.					
Bridle et al. (2005). United Kingdom	To evaluate the effectiveness of TTM interventions in facilitating health-related behaviour change.	Systematic review of RCTs 2000-2005	<ul style="list-style-type: none"> • 37 RCTs targeting 7 health-related behaviours • Inclusion: 1)RCTs 2)Interventions using TTM 	Limited evidence of effectiveness of stage-based intervention.	Quality of trials was variable <ul style="list-style-type: none"> • Heterogeneity difficult to draw conclusions • Lack of model specification was identified 	I
Brown et al. (2009). United Kingdom	To determine the effectiveness of long-term lifestyle interventions for the prevention of weight gain and morbidity in adults.	Systematic review -1990-2007 RCTs and controlled before and after studies Interventions ≥ 2 years	<ul style="list-style-type: none"> • 40 studies • Included healthy weight, overweight and obese. 	11 out of 39 produced significant improvement in weight between groups at ≥ 2 years mean difference weight change ranging -0.5 to -11.5 kg. Diet with exercise and/or behaviour therapy demonstrated significant reduction in hypertension and improvement in risk of metabolic syndrome and diabetes compared with no treatment control.	<ul style="list-style-type: none"> • Highlighted limited evidence for healthy-normal weight adults in community. 	I
Buckley & Lower (2002). Australia	To determine and describe the factors that influence the utilisation of health services by rural men in the Midwest region of WA.	Mixed method Cross sectional descriptive studies, individual interviews and focus groups then postal surveys	<ul style="list-style-type: none"> • 71 rural men, then n=289 surveys returned • Age > 55 years 	Barriers to accessing services included age, long working hours, the requirements of seasonal work, discomfort in the waiting room environment, privacy issues centring on others not knowing they have visited a service and a fear of knowing their true health status. 4 factors identified as predictors of health service use in the past six months from the logistic regression. Males who accessed services for preventive purposes (OR 2.44), who were not restricted due to seasonal work (OR 1.62), those who thought a medical telephone line was not important (OR 4.98) and those who were not	<ul style="list-style-type: none"> • Low response rate 31% • Relevant to regional WA • Older men 	IV

				concerned by privacy issues (OR 2.57) were predictive factors.		
Buckley & O'Tuama (2010). Ireland	First stage of a wider project aimed at increasing the effectiveness of skin cancer awareness messages aimed at men.	Qualitative-focus group	<ul style="list-style-type: none"> • n=18 socially disadvantaged groups in Ireland • Aged 50-70 years 	5 broad themes: 1) Mixed knowledge about cancer, and specific cancer indicators 2) Reticence to engage in health-seeking behaviour 3) Health seeking perceived to be a female trait 4) Underlying fear and fatalism with regard to health issues 5) Perceptions of disconnection from health service Testimonial advertising contributing to disconnection.	<ul style="list-style-type: none"> • Ireland- specific location not mentioned • Demographics characteristics limited • Focus on skin cancer • Relevant for men's health help seeking behaviour 	V
Coles et al. (2010). United Kingdom	To examine the influence of social deprivation and age on the health care requirements of men.	Qualitative design Focus groups	<ul style="list-style-type: none"> • n=82 • Men • >40 years 	4 key themes: <ul style="list-style-type: none"> • masculine culture; • services for men; • interpersonal interaction, and; • advertising and information. 	<ul style="list-style-type: none"> • United Kingdom based • Relevance for men's health help seeking behaviour 	V
Conn et al. (2009). United States	To assess the summarised health and physical activity behaviour outcomes from workplace health programs.	Meta-analysis 1969-2007.	<ul style="list-style-type: none"> • 138 studies, n=38,231 participants post-test n=24,520 participants • Inclusion: 1) Interventions aimed to increase PA 2) Various designs 	Significantly positive effects were observed for physical activity behaviour (0.21); fitness (0.57); lipids (0.13); anthropometric measures (0.08); work attendance (0.19); and job stress (0.33). Although findings on improved work attendance, job satisfaction, and job stress were mixed. Suggests some physical activity programs are effective beyond direct health benefits.	<ul style="list-style-type: none"> • Small sample size • Longer follow-up needed • Relevant to effective physical activity interventions 	I
Conn et al. (2011). United States	To summarise the effects of interventions designed to increase physical activity	Meta-analysis 1960-2007	<ul style="list-style-type: none"> • 358 studies n=99011 participants Post intervention analyses= 74852 	Exploratory moderator analyses suggested that the characteristics of the most effective interventions were behavioural interventions instead of cognitive interventions, face-to-face delivery versus mediated interventions	<ul style="list-style-type: none"> • Not workplace specific • Inclusion of pre-experimental studies • Face-to-face more effective than telephone 	I

	among healthy adults.		<p>participants (206 comparisons).</p> <ul style="list-style-type: none"> • Mean age 44 years • Median 74% women • Inclusion: Interventions to increase PA in adults. 	<p>(e.g., via telephone or mail), and targeting individuals instead of communities. Participant characteristics were unrelated to physical activity effect sizes.</p>	<ul style="list-style-type: none"> • Relevant to physical activity focused interventions 	
<p>Douketis et al. (2005).</p> <p>Canada</p>	<p>To assess long-term (> 2 years) studies investigating dietary/lifestyle, pharmacologic, and surgical weight loss methods to assess (1) weight loss efficacy, (2) effects of weight loss on cardiovascular risk factors, and (3) applicability of findings from studies to everyday clinical practice.</p>	<p>Systematic review 1966-2003</p>	<ul style="list-style-type: none"> • 44 studies • 19273 subjects • 34-59 years • Inclusion: <ul style="list-style-type: none"> 1) Clinical trials 2) Overweight/obese adults 3) investigated a prespecified dietary/lifestyle, pharmacologic, or surgical weight loss method. 	<p>Dietary/lifestyle and pharmacologic weight loss interventions provide modest weight loss, and may improve markers of cardiovascular risk factors although these benefits occur mainly in patients with cardiovascular risks. Dietary/lifestyle therapy was associated with modest (<5 kg) weight loss after 1-2 years, although was corroborated in the dietary-only arms of pharmacologic therapy studies, in which weight loss was 1.7–4.9 kg. Pharmacologic therapy had a three-fold greater odds of attaining such weight loss than subjects who received diet only therapy (OR 42.94; 95% CI: 2.47–3.50)</p>	<ul style="list-style-type: none"> • Not worksite focused. • Although includes some lifestyle related interventions, also discussed pharmacological and surgical based rather than lifestyle focused • High attrition noted 	I
<p>Dugdill et al. (2007).</p> <p>and</p> <p>Dugdill et al. (2008).</p> <p>United Kingdom</p>	<p>To identify effective and motivating factors for interventions that were workplace based or initiated from the employer, that aimed to increase physical</p>	<p>Systematic review between 1996-2007</p> <p>All types of interventions</p> <p>Excluded studies from US and Asia</p>	<ul style="list-style-type: none"> • 38 publications-representing 33 studies • Inclusion <ul style="list-style-type: none"> 1) Workplace initiative 2) Employed adults 	<p>These were grouped into five key areas: systematic effectiveness reviews of workplace physical activity interventions; stair walking interventions; walking interventions; active travel; and other. Barriers included loss of interest, lack of time</p> <p>Facilitators included location of exercise setting/ convenience important; wanted</p>	<ul style="list-style-type: none"> • Studies ranged in design and quality • Minimal information of qualitative aspects of the intervention studies. • Major gap identified in the included literature was regarding perspectives of the employer 	I

	activity of employees, and were applicable to England.		3)Outcome measure- PA 4)Evidence of behavioural or physical change.	encouragement from employers and practical changes to encourage physical activity at work e.g., bicycle parking, lunch time classes. Walking interventions using pedometers increase physical activity. Strong evidence of workplace counselling. Lack of information for small/ medium workplaces. Many studies (n=16) had multicomponent interventions which made difficult to attribute effects.	<ul style="list-style-type: none"> • Gap highlighted need for research in small/medium workplaces • Highlights that RCTs may not be appropriate to effectively measure interventions 	
Engbers et al. (2005). Netherlands	To assess the effectiveness of WHPPs with environmental modifications on physical activity, diet and health risk indicators.	Systematic review RCTs up to 2004	<ul style="list-style-type: none"> • 4 studies focused on blue-collar only • Inclusion: 1)RCTs 2)Workplace interventions 3)Healthy working population. 	13 multicentre trials. All focused on diet, 3 on physical activity. All multicomponent intervention, most targeted lifestyle factors. Follow-up was on average 1 year. Strong evidence for effect on diet, inconclusive for physical activity, no evidence for health risk indicators. Environmental modifications can influence dietary intake. Blue and white-collar workers.	<ul style="list-style-type: none"> • International literature • Quality of articles was poor 	I
Fletcher et al. (2002). Australia	To estimate the prevalence of health concerns, experiences and expressed needs among men and compare these with earlier data for women.	Cross sectional survey	<ul style="list-style-type: none"> • n=392 • Australian men • Randomly selected from electoral roll. 	The most frequently reported conditions for men in this study were stress, tiredness, back problems, overweight and lack of exercise. Results suggest that both men and women have similar concerns.	<ul style="list-style-type: none"> • Many of the issues identified are encompassed by the national health priorities • Relevant to Australia rural men • Blue-collar, never married men under-represented. 	IV
Fleury et al. (2009).	To review and evaluate the roles, evaluation, and effectiveness of Lay Health Advisor in	Systematic review 1980-2007	<ul style="list-style-type: none"> • 20 articles • Majority of studies targeted vulnerable and underserved 	Identified varied Lay Health Advisor roles Most health outcomes included weight loss, BMI or blood pressure- found Lay Health Advisor had positive impact on health outcomes.	<ul style="list-style-type: none"> • Heterogeneity of studies make it difficult to conclude • Support use of LHA 	I

	community based programs with an emphasis on cardiovascular risk reduction.		populations (African Americans, women, low income).			
Foster et al. (2009). United Kingdom	To assess the effectiveness of lay-led self-management programmes for people with chronic conditions.	Systematic review of RCTs 1986 2006	<ul style="list-style-type: none"> • 17 RCTs • n=7442 participants • Inclusion: <ol style="list-style-type: none"> 1) RCTs 2) Lay- led interventions targeting people with chronic conditions. 	Only one study > 6 months Health behaviours: 7 studies showed a small, statistically-significant increase in self-reported aerobic exercise (SMD -0.20 (95% CI -0.27 to -0.12)) and a moderate increase in cognitive symptom management (4 studies, WMD -0.55 (95% CI -0.85 to -0.26)). Self-efficacy- small statistically-significant improvement (10 studies): SMD -0.30, 95% CI -0.41 to -0.19.	<ul style="list-style-type: none"> • Lay-led self-management interventions small short-term effect. • Long-term effect unclear 	I
Galdas et al. (2005). United Kingdom	To review literature regarding men's health-related help seeking behaviour.	Literature review 1966-2003	<ul style="list-style-type: none"> • 124 studies • Inclusion: <ol style="list-style-type: none"> 1)Help seeking behaviours related to gender, 2) English. 	Gender-specific studies highlights a trend of delayed help seeking when they become ill. A prominent theme among white middle class men implicates 'traditional masculine behaviour' as an explanation for delays in seeking help among men who experience illness.	<ul style="list-style-type: none"> • Not reported as a systematic review • Relevant to men's health help seeking behaviours 	V
Galdas et al. (2014). United Kingdom	To determine whether current self-management support interventions are acceptable and accessible to men with long-term conditions, and explore what may act as facilitators	Systematic review of qualitative studies in July 2013	<ul style="list-style-type: none"> • 38 studies • Inclusion: <ol style="list-style-type: none"> 1)qualitative data 2)English 3)Participants with one or more long term condition 4)Data collected in relation to self-management 	Four constructs associated with men's experience of, and perceptions towards, self-management support were identified: 1) need for purpose; 2) trusted environments; 3) value of peers; and 4) becoming an expert. Men feel less comfortable participating in self-management support when activities are perceived to challenge masculine ideals associated with independence, stoicism, and control. Men may find self-management support more	<ul style="list-style-type: none"> • Review of qualitative studies • Clear recommendations for self-management interventions targeting men 	I

	and barriers to access of interventions and support activities.		support activities and interventions	attractive when it is perceived as action-oriented, having a clear purpose, and offering personally meaningful information and practical strategies that can be integrated into daily life. Self-management support is most likely to be successful in engaging men when it is congruent with key aspects of their masculine identity.		
Geaney et al. (2013). Ireland	To evaluate the effectiveness of workplace dietary modification interventions alone or in combination with nutrition education on employees' dietary behaviour, health status, self-efficacy, perceived health, determinants of food choice, nutrition knowledge, co-worker support, job satisfaction, economic cost and food-purchasing patterns.	Systematic review of RCTs and controlled trials 1951-2011	<ul style="list-style-type: none"> • 6 studies > 3 months duration • Adults > 18 years • In paid employment • Without medical condition 	4 studies reported small increases in fruit and vegetable intake. Limited evidence suggests that workplace dietary modification interventions alone and in combination with nutrition education increased fruit and vegetable intake.	<ul style="list-style-type: none"> • Few studies • Methodologically poor quality of studies reviewed • Suggests workplace education and dietary modifications can improve intake 	I
Goldgruber & Ahren (2010). Austria	To summarize current reviews on the effectiveness of health promotion and primary prevention	Systematic review of Systematic reviews or meta-analyses 2004-2008	<ul style="list-style-type: none"> • 17 articles • Inclusion: 1) Meta-analysis or systematic reviews, 	Categorised into the following areas of intervention: stress, physical activity and nutrition, organisational development, smoking, and ergonomics and back pain. Singular interventions showed limited effectiveness. Workplace interventions	<ul style="list-style-type: none"> • Multicomponent interventions more effective • Workplace health promotion interventions are not only feasible, but also effective. 	I

	interventions in the workplace.	English and German.	2) Published 2004 and 2008 3) English/ German 3) examined workplace health promotion	aimed at helping individuals reported substantially greater effects than workplace interventions aimed at the workforce as a whole.		
Greaves et al. (2011). United Kingdom	To identify intervention components that are associated with increased change in diet and/or physical activity in individuals at risk of type 2 diabetes.	Systematic review of systematic reviews 1998-2008	<ul style="list-style-type: none"> • 30 articles- 1129 analyses • Inclusion: <ol style="list-style-type: none"> 1)Adults > 18 years 2)At risk of Diabetes 3)Interventions targeting PA or dietary changes. 	Interventions produced clinically meaningful weight loss (3-5 kg at 12 months; 2-3 kg at 36 months) and increased physical activity (30-60 mins/week of moderate activity at 12-18 months). Intervention effectiveness was increased by engaging social support, targeting both diet and physical activity, and using well-defined/established behaviour change techniques. Increased effectiveness was also associated with increased contact frequency and using a specific cluster of “self-regulatory” behaviour change techniques (e.g., goal-setting, self-monitoring).	<ul style="list-style-type: none"> • Individuals “at risk” of type 2 diabetes • Mix of settings including workplace • Inadequate descriptions of interventions • Highlighted self-management component • Effectiveness of behaviour change technique • Short-term effects only 	I
Groeneveld et al. (2010). Netherlands	To summarise the evidence for an effect of lifestyle-targeted interventions at workplace on the main biological risk factors for CVD.	Systematic review of RCTs and controlled trials 1987-2008	<ul style="list-style-type: none"> • 31 RCTs • Inclusion: <ol style="list-style-type: none"> 1)Clinical trials 2)Workplace interventions targeting Male and female, Blue and white collar occupations, All ages. 	18 studies were of high quality. Strong evidence for the effectiveness of workplace lifestyle based interventions on body fat. Inconsistency in findings noted for study populations, interventions and measurement methods.	<ul style="list-style-type: none"> • Relevant for people at risk • Inconsistent results evident 	I
Groeneveld et al. (2011). Netherlands	To evaluate the effects on physical activity, diet, and smoking of a lifestyle	RCT	<ul style="list-style-type: none"> • n=816 • 18-65years • male blue and white-collar workers in 	Statistically significant beneficial effect on snack intake (b-1.9, 95%CI -3.7; -0.02) and fruit intake (b 1.7, 95%CI 0.6; 2.9) at 6 months. The effect on snack intake was sustained until 12 months; 6 months after the	<ul style="list-style-type: none"> • No validated questionnaire was used for dietary intake • Although RCT, contamination between groups could occur. 	II

	intervention consisting of individual counselling among male workers in the construction industry with an elevated risk of CVD.		<p>construction industry with risk of CVD</p> <ul style="list-style-type: none"> • >400 companies in Netherlands • IG=individual counselling using motivational interviewing techniques, • CG= consisted of brief oral or written information about risk profile, based on health screening results. 	<p>intervention had ended (b -1.9, 95%CI -3.6; -0.2). The intervention effects on leisure time physical activity and metabolic equivalent-minutes were not statistically significant. The beneficial effect on smoking was statistically significant at 6 (OR smoking 0.3, 95%CI 0.1;0.7), but not at 12 months (OR 0.8, 95%CI 0.4; 1.6). Participants were older and more likely to smoke than non-participants.</p>	<ul style="list-style-type: none"> • 400 different companies- many extraneous variables. • 6 months duration only 	
<p>Gudzune et al. (2013).</p> <p>United States</p>	To compare the effectiveness of self-management, dietary, physical activity, and/or environmental strategies for the prevention of weight gain among adults in work and college settings.	Systematic review of work/college-based studies with follow-up over at least a 12-month period.	<ul style="list-style-type: none"> • 9 studies • n=76,465 participants change at 12 months or greater.- 	7 work-, 2 college-based studies moderate strength of evidence that work/college-based combination interventions prevented weight gain of ≥ 0.5 kg over 12 months as compared to control. Meta-analysis was not conducted due to heterogeneity of intervention strategies and study populations. These programs did not prevent BMI gain or waist circumference increase.	<ul style="list-style-type: none"> • Few studies • Noted that the fact that weight is being monitored regularly may help individuals to maintain weight without an intensive intervention. • Quality of studies poor • Relevant to the influence of self-management initiatives of dietary, physical activity, and/or environmental intervention or exposure on the outcome of BMI, weight, or waist circumference 	I
<p>Heading (2008).</p> <p>Australia</p>	To explore risk logics, embodiment (the interplay between the physical, social and	Qualitative multiple-method design using semi-structured interviews and	<ul style="list-style-type: none"> • n=19 rural adults (13 female; six male). 	Thematic analysis revealed 14 major weight related themes. Respondents raised numerous explanations for their weight gain, reported struggles with weight loss, and revealed a range of motivations for weight	<ul style="list-style-type: none"> • Recruited community members by advertisements • Only 6 males to explore. 	V

	subjective body) and issues related to adult obesity in remote New South Wales.	visual aids (food and exercise palm cards).		loss and a variety of approaches to risk; not all of which are aligned to dominant health discourse. The need for realistic interventions incorporating social meaning and pleasure seeking is revealed. Incorporating risk logics and pleasure seeking will make obesity interventions more relevant.		
Hutchison et al. (2009). United Kingdom	To review critically examines TTM–based interventions for PA behaviour change.	Systematic review 1982-2007	<ul style="list-style-type: none"> • 34 articles, 24 interventions. 21 RCTs, 3 non-RCTs. • Inclusion: <ol style="list-style-type: none"> 1) Controlled trials 2) interventions based on the TTM that aim to promote PA behaviour change 3) Outcome-physical cognitive/ 	Noted inconsistencies regarding the development and implementation/application of TTM-based interventions. Most fail to represent all aspects of the model. Short-term (<6 months), 18 of the 24 studies (75%) reported a significant effect for TTM-based interventions over control conditions in terms of stage progression, activity levels, or both. Long-term results (> 6 months) were obtained in 8 out of the 24 interventions (33%), and only 2 conducted follow-up assessments past 12 months (8%).	<ul style="list-style-type: none"> • Highlights inconsistencies with development and implementation of TTM interventions • Long-term impact unclear • Doesn't cover application of TTM for diet 	I
Hutchinson & Wilson (2011). Australia	To review the outcomes of workplace interventions that promote physical activity or dietary changes and to make recommendations for the design and implementation of future programmes.	Meta-analysis of workplace studies published 1999-2009. Grouped into theoretical frameworks	<ul style="list-style-type: none"> • 29 studies • Inclusion: <ol style="list-style-type: none"> 1) workplace intervention, 2) Outcome measures were health, and in particular diet, nutrition or physical activity 3) adequate 	Average duration was 9-18 months. Most did not have a follow-up. Post intervention and change over time were inconsistent. Large effect was found for the motivational enhancement (such as motivational interviewing- particularly for physical activity and blood pressure but not weight approach (mean d= 1.98). Workplace is a suitable environment for making modest changes in the physical activity, nutrition and health of employees.	<ul style="list-style-type: none"> • Focused on determining theoretical frameworks are associated with improvements in diet, health and increased physical activity. • Short-term effect only • Need to focus on long-term effect 	I

			statistical for effect sizes.			
Keranen et al. (2009). Finland	To investigate the effects of intensive counselling on eating behaviour and weight loss and maintenance and their associations.	RCT weight loss counselling intervention with follow-up at 18 months	<ul style="list-style-type: none"> • n=82 participants • mean age 49 • 28% male with BMI $\geq 27\text{kg/m}^2$. • IG= intensive counselling • CG=short-term counselling 	Eating behaviour improved in both groups. Effect of counselling was -5.0 ± 5.7 kg compared with -2.4 ± 2.5 kg in the control group ($p<0.05$ between the groups) during the first 6 months. At 18 months the weight loss results were -2.6 ± 6 kg and -0.7 ± 3.5 kg, respectively (NS). Success in weight loss maintenance is associated with improved eating behaviour ($p<0.05$). Both intensive and short-term interventions improved eating behaviour and weight loss but there was no difference between the two modes of intervention.	<ul style="list-style-type: none"> • Highlights effectiveness of either counselling intervention for weight loss • 18 months duration 	II
Kirk et al. (2012). Canada	To synthesise the available evidence, determine most effective and most promising practices for obesity management in adults.	Systematic review 2009-2010	<ul style="list-style-type: none"> • 6 meta analyses, 10 systematic reviews, 9 non-systematic reviews 	3 themes 1) targeted multicomponent interventions for weight management, 2) dietary manipulation strategies and 3) delivery of weight management interventions, including health professional roles and method of delivery.	<ul style="list-style-type: none"> • Highlights the value of multicomponent interventions that are delivered over the longer-term 	I
Kolmet et al. (2006). Australia	To investigate male blue-collar workers understanding of health determinants, gender issues related to health, and workplace health promotion.	Qualitative	<ul style="list-style-type: none"> • n=48 • 7 focus-group discussions • Workplaces - male blue-collar employees. • Anglo-Australian men • 20-50 years. 	Findings focused on health determinants, perception of workplace health promotion, challenges. Overall demonstrated that participants were appreciative of workplace health promotion, and recognised as a motivation to change unhealthy routines. Suggests that opportunities exist to support and promote the health status of male blue-collar workers in the workplace.	<ul style="list-style-type: none"> • Australian blue-collar • Recruited from government organisations, therefore conditions may be different than private settings 	V
Maes et al. (2011).	To summarise the evidence of effect of intervention	Systematic review 1990-2010	<ul style="list-style-type: none"> • 37 articles reported 30 studies 	17 focused on nutrition, 13 focused on nutrition and physical activity.	<ul style="list-style-type: none"> • Methodologically poor quality of studies reviewed • Not all dietary only focused 	I

Netherlands	studies in European countries promoting a healthy diet solely and in combination with increasing physical activity at the workplace.		<ul style="list-style-type: none"> • Inclusion: <ol style="list-style-type: none"> 1) European studies 2) worksite-based interventions promoting a healthy diet solely or in combination with physical activity, 3) Adults >18 years, 4) Outcome measurement of anthropometrical or behavioural change 	Moderate evidence of effect of educational and multicomponent dietary interventions on dietary behaviours and potential dietary determinants of such behaviours in workplaces.	<ul style="list-style-type: none"> • Relevant to Australian workplace 	
Malik et al. (2013). United Kingdom	To explore the types of interventions workplaces implement to promote physical activity among staff	Systematic review up to 2011	<ul style="list-style-type: none"> • 58 studies, 6 physical activity interventions • Inclusion: <ol style="list-style-type: none"> 1) Intervention designed to increase energy expenditure, 2) Conducted in a workplace setting; 3) Outcome measure assessing level of physical activity 4) RCT, prospective randomised trial, 	13 counselling/ support interventions and 39 health promotion. 32 showed significant increase in physical activity against control. Results mostly inconclusive. Unclear which interventions and delivery formats are more effective than others.	<ul style="list-style-type: none"> • Heterogeneity of studies did not allow for meta-analysis. • Long-term effect unclear 	I

			quasi-experimental			
Mahalik et al. (2007). United States	To examine the contributions of masculinity and men's perceptions of the 'normativeness' of men's and women's health behaviours in predicting men's self-reported health behaviours.	Cross sectional survey	<ul style="list-style-type: none"> • n=140 • men • 18-78 years • Recruited online 	Masculinity and the perceived 'normativeness' of other men's health behaviours significantly predicted participants' own health behaviours beyond that accounted for by socio-demographic variables. Masculinity reported lower frequencies of health promoting behaviours ($\beta=-0.36, p<0.001$). When they conformed less to traditional masculine norms and perceived that other men engaged in health-promoting behaviours.	<ul style="list-style-type: none"> • Assists to understand men's poorer health practices • Sample bias- recruited online • Lack demographic characteristics of sample 	IV
Michie et al. (2009). United Kingdom	To assess the effectiveness of active behaviour change interventions designed to promote physical activity and healthy eating and investigate whether theoretically specified techniques improve outcome.	Meta-analysis 1990-2008	<ul style="list-style-type: none"> • 101 papers reporting 122 evaluations • n= 44,747 	The 122 evaluations produced an overall pooled effect size of 0.31 (95% CI 0.26 to 0.36, I^2 69%). Self-monitoring," explained the greatest amount of among-study heterogeneity (13%). Interventions that combined self-monitoring with at least one other technique derived from control theory were significantly more effective than the other interventions (0.42 versus 0.26).	<ul style="list-style-type: none"> • Included experimental and quasi-experimental studies • Highlighted effectiveness of self-management 	I
Montano et al. (2014). Germany	To assess what types of socioeconomic positions (SEP) are being considered in randomised controlled intervention studies	Meta-analysis	<ul style="list-style-type: none"> • 36 RCTs - 40 interventions workplace interventions. • Inclusion: 1)Studies classified by participants' 	BMI, self-reported musculoskeletal symptoms, and self-reported job stress decreased [SMD -0.16, (95% CI) -0.29– -0.02, SMD -0.32, 95% CI -0.51– -0.14, and SMD -0.37, 95% CI -0.71– -0.04, respectively], whereas daily consumption of fruit and vegetables increased (SMD 0.12, 95% CI 0.01–0.22). There were no	<ul style="list-style-type: none"> • Targeting socioeconomic class • Inconclusive findings about class • Suggest future research into worksite health to consider social determinants of health 	I

	and estimate the moderation of SEP in workplace intervention effects on BMI, fruit and vegetable consumption, musculoskeletal symptoms, and job stress.		socioeconomic positions. 2)RCTs 3)Sample size of >80 participants 4)Outcome measures: BMI, perceived stress, fruit & vegetable consumption, musculoskeletal symptoms.	statistically significant differences between occupational classes for the health outcomes considered. Workplace interventions can achieve small positive effects on major health outcomes. Results indicate that more than twice as many intervention trials were conducted among higher than lower skilled occupational groups. Could not confirm if effects were moderated by class.		
Müller-Riemenschneider et al. (2008). Germany	To evaluate the long-term effectiveness of physical activity interventions targeted at healthy adults and to identify effective intervention components.	Systematic review 2001- 2007	<ul style="list-style-type: none"> • 25 studies RCTs with interventions of greater than 12 months duration • Inclusion: <ol style="list-style-type: none"> 1)English and German 2)RCTs 3)Interventions aimed at PA 4) Outcome measure: PA 	Maximum duration 24 months- evidence for long-term increases in physical activity behaviour and physical fitness. Moderate decline of physical activity behaviour occurred between early and late follow-up was observed, however the reported intervention effects were mostly stable. Suggested booster interventions can facilitate long-term effectiveness.	<ul style="list-style-type: none"> • Effectiveness of which mode of booster intervention is unclear • Maximum duration 2 years therefore sustainability unknown 	I
National Health & Medical Research Council [NHMRC] (2013b). Australia	To review the evidence related to obesity.	Systematic review 2007- 2011	<ul style="list-style-type: none"> • 137 articles- 70 systematic reviews/ meta analyses, 67 RCTs. • Inclusion: <ol style="list-style-type: none"> 1)Quantitative studies 2)Overweight/obese adults 	Explored weight loss interventions- identified that lifestyle change was least effective compared to surgery and pharmacotherapy. Most effective and sustained losses when combining diet and physical activity. Patient interventions included education, self-management, and patient reminder systems (e.g., phone, letter, electronic systems). Self-management techniques often component of multicomponent intervention	<ul style="list-style-type: none"> • Highlighted the importance of self-management strategies for the management of obesity. • Evidence of long-term effect unclear 	I

			Outcome: Weight/biophysical markers	rather than standalone. Self-management support can increase weight loss in the short-term.		
Ni Mhurchu et al. (2010). United Kingdom	To assess the effects of worksite interventions on employee diets.	Systematic review 1995-2009.	<ul style="list-style-type: none"> • 16 studies • Worksite-based health promotion intervention with minimum study duration of eight weeks • Mostly North American studies 	8 (50%) programmes focussed on employee education, and the remainder targeted change to the worksite environment either alone or in combination with education. Worksite interventions led to positive changes in fruit, vegetable and total fat intake. Therefore associated with moderate improvement in dietary intake. Follow-up 12 weeks to 2.5 years.	<ul style="list-style-type: none"> • Study methodological quality was moderate • Interventions focus on diet • Did not specify population • Self-reported methods of dietary assessment contribute to bias 	I
O'Brien et al. (2005). United Kingdom	To explore experiences of help seeking and its relation to, and implications for, the practice of masculinity amongst a diversity of men.	Qualitative study 14 focus groups,	<ul style="list-style-type: none"> • n=55 • Scottish men participated • 15–72 years • Diversity in occupational, socio-economic status. 	Findings suggest widespread view that men 'should' be reluctant to seek help, particularly amongst younger men. Instances which questioned or went against this apparent reluctance to seek help. Help seeking was linked with masculinity: help seeking was more quickly embraced when it was perceived as a means to preserve or restore another, more valued, enactment of masculinity.	<ul style="list-style-type: none"> • Relevant to men's reluctance to seek health help. 	V
O'Kane et al. (2008b & c). Australia	To identify the barriers experienced by a sample of rural Australian men to adhering to a healthy diet and regular physical activity, and solutions to overcoming these barriers and to determine the attitudes of rural	Quantitative postal survey & Qualitative-Focus group.	<p><u>Quantitative</u></p> <ul style="list-style-type: none"> • n=529 (27% response rate). • Australian men randomly selected from electoral roll in rural NSW. • Aged 25-64 years <p><u>Qualitative:</u></p> <ul style="list-style-type: none"> • n=42 Australian rural men • 25–64 years, 	The major barriers to eating a healthy diet were lack of willpower (39%), lack of time (24%) and enjoying eating "unhealthy" foods (24%). Barriers to undertaking physical activity were lack of time (43%), lack of willpower (36%), tiredness (27%) and long hours in sedentary jobs (27%). Key themes focused on Body Image (appearance, physique), Attitude to health (health scare, enjoy living, avoiding healthcare professionals, cultural imperatives). Many of the masculine myths surrounding male behaviour in relation to	<ul style="list-style-type: none"> • Low response rate for quantitative (27%) • More married men • Intermediate production and labourers underrepresented. • Relevance for understanding barriers for rural men. • Mostly married and older men • Relevant to rural men and health 	IV

	men to matters of health and body image.		<ul style="list-style-type: none"> • mean 50.5 years, most married, four focus groups, one exclusively for farmers, in south-western NSW. 	health and ideas on body image persist among rural men in south-western NSW. Talking about health was not considered a male past-time; visiting health professionals was still seen as a last resort; being a 'big bloke' was perceived to be advantageous and heavy drinking is still considered an Australian male domain, especially among the younger men in the groups.		
Parikh et al. (2010). United States	To measure the effectiveness of a peer-led lifestyle intervention (Help Educate to Eliminate Diabetes Project HEED) in promoting weight loss among overweight adults with pre-diabetes in East Harlem.	RCT -a peer-led intervention to promote weight loss	<ul style="list-style-type: none"> • n=99 adults • mean age 48 years with a BMI > 25 kg/m²). • Majority predominately Spanish speaking, low income women. 	More than half of those tested (56%, or 99 of 178) had pre-diabetes and enrolled in the study. IG lost significantly more weight than the control group and maintained weight loss at 12 months (7.2 versus 2.4 pounds; $p<.01$). Finding suggest peer led- community based interventions can be successful at promoting weight loss.	<ul style="list-style-type: none"> • Majority women • Relevant to peer led, community based interventions 	II
Pettman et al. (2008). Australia	To assess a group-based lifestyle education program based upon national diet and physical activity recommendations to manage obesity and cardio-metabolic risk factors.	RCT	<ul style="list-style-type: none"> • n=153 overweight/obese adults with metabolic syndrome • IG- 16 week lifestyle program including self-management tools and peer support • CG- no intervention 	Self-management techniques helpful, namely problem solving and short-term goal setting. Group setting and supportive 'peer' leaders were found to be supportive.	<ul style="list-style-type: none"> • Suggested self-management techniques and group settings are effective 	II

Proper et al. (2003). Netherlands	To critically review the literature with respect to the effectiveness of worksite physical activity programs on physical activity, physical fitness, and health.	Systematic review of RCTs or non-RCTs 1980-2000	<ul style="list-style-type: none"> • 15 RCTs and controlled trials, 11 non RCTs • Inclusion: <ol style="list-style-type: none"> 1) Controlled trial 2) Healthy employees 3) Intervention targeted PA 4) Outcome- PA or health. 	Strong evidence was found for a positive effect of a worksite physical activity program on physical activity and musculoskeletal disorders. Limited evidence was found for a positive effect on fatigue. For physical fitness, general health, blood serum lipids, and blood pressure, inconclusive or no evidence was found for a positive effect.	<ul style="list-style-type: none"> • Healthy, non-obese populations • Relevant to workplace interventions 	I
Rhodes et al. (2007). United States	To explore how lay health advisors approaches have been used and evaluated within Hispanic/Latino communities in the U.S.	Qualitative systematic review up to 2006	<ul style="list-style-type: none"> • 37 studies • 5 studies used men as LHA and none targeted men • Inclusion: <ol style="list-style-type: none"> 1) Qualitative designs 2) Intervention involving LHA in Hispanic/Latino communities. 	Primary roles of lay leaders included: supporting participant recruitment and data collection, serving as health advisors and referral sources, distributing materials, being role models, and advocating on behalf of community members. 14 studies found evidence of effectiveness- only 12 had control group.	<ul style="list-style-type: none"> • Identified lack of interventions involving men 	I
Riemsma et al. (2002). United Kingdom	To assess the effectiveness of interventions using a stage-based approach in bringing about positive changes in health related behaviour.	Systematic review- up to 2000	<ul style="list-style-type: none"> • 37 RCTs • Inclusion: <ol style="list-style-type: none"> 1) RCTs, 2) Interventions focused on individual health behaviour, used within a stages-of-change 	17 showed no significant differences between groups, 8 showed mixed effects, & 10 trials showed effects in favour of the stage-based intervention. Little evidence to suggest that stage-based interventions are more effective compared to non-stage-based interventions. Unclear whether the interventions were properly stage-based.	<ul style="list-style-type: none"> • Methodological quality of studies were mixed • Highlight need for accurate stage measurement- requires frequent reassessment of readiness to change 	I
Robertson et al. (2008).	To appraise the evidence of effective	Systematic review- 1990-2006	<ul style="list-style-type: none"> • 27 studies. • Inclusion: 	Most studies were male sex-specific, i.e., prostate cancer screening and testicular self-examination. Other topics included alcohol,	<ul style="list-style-type: none"> • Excluded studies of generic interventions targeting both men and women 	I

United Kingdom	interventions aimed at improving men's health.		1)participants: healthy adult men ≥ 18 years 2) intervention: aimed at improving men's health, 3)conducted developed countries;4)outcomes: health status, knowledge, attitudes, behaviour randomised 5)controlled trials (RCTs), quasi-randomised	CVD, diet and physical activity, skin cancer and smoking cessation. 23 interventions were effective or partially effective at improving health outcomes and 18 studies satisfied all quality criteria	<ul style="list-style-type: none"> Does not suggest that targeting men works better than generic programs 	
Robroek et al. (2009). Netherlands	To review initial participation in worksite health promotion programmes, the underlying determinants of participation, and programme characteristics influencing participation levels.	Systematic review- 1988-2007	<ul style="list-style-type: none"> 23 studies 10education/ counselling, 6 fitness centre, 7 multicomponent interventions. 	Participation rates low- 10-64%- median 33% (95%CI- 25-42%). Men lower participation rates except in fitness centre interventions. Strategies increase participation include incentives and multicomponent interventions	<ul style="list-style-type: none"> Participation in workplace intervention is low Strategies can enhance participation 	I
Rongen et al. (2013). Netherlands	To investigate the influence of population, study and intervention	Systematic review RCTs-up to June 2012	<ul style="list-style-type: none"> 18 studies-21 interventions Mixed populations, 	Overall effect small (ES 0.24, 95% CI 0.14, 0.34). Effectiveness was larger in white-collar, younger populations, in interventions with weekly contacts, and in studies in	<ul style="list-style-type: none"> Two Australian studies 	I

	characteristics, and study quality on the effectiveness of workplace health promotion programs.		<p>didn't specific gender</p> <ul style="list-style-type: none"> Inclusion: <ol style="list-style-type: none"> 1) Workplace program aimed at PA, nutrition, weight loss, or smoking cessation; 2) evaluate the effects on self-perceived health, productivity at work, sickness absence, or work ability 3) RCTs 	which the control group received no health promotion. Studies of poor methodological quality reported a 2.9-fold higher effect size.		
Shaw et al. (2006). Australia	To assess the effects of psychological interventions for overweight or obesity as a means of achieving sustained weight loss.	Systematic review and meta-analysis up to 2003	<ul style="list-style-type: none"> 36 studies of 3495 participants. Inclusion: <ol style="list-style-type: none"> 1) RCTs, quasi-trials, 2) All psychological interventions targeting weight loss. 	Behaviour therapy was found to result in significantly greater weight reductions than placebo when assessed as a stand-alone weight loss strategy (mean difference -2.5 kg; 95% CI -1.7 to -3.3). When behaviour therapy was combined with a diet / exercise approach and compared with diet / exercise alone, the combined intervention resulted in a greater weight reduction.	<ul style="list-style-type: none"> Recommends the use of psychological interventions, particularly behavioural and cognitive-behavioural to enhance weight reduction 	I
Small et al. (2013). United Kingdom	To assess the effectiveness and cost-effectiveness of telephone self-management interventions led by 'lay health workers' and 'peer support	Systematic review of RCTs	<ul style="list-style-type: none"> 10 studies Inclusion: <ol style="list-style-type: none"> 1) RCTs of psychological intervention vs comparison intervention, 2) outcome 	Peer telephone support had small but significant improvements in self-management behaviour (standardised mean difference = 0.19, 95% CI 0.05 to 0.33, $I^2 = 20.4\%$).	<ul style="list-style-type: none"> Mostly reviewed American studies Suggested telephone self-management interventions via 'lay workers' and 'peer support workers' for patients on diabetes control and self-management outcomes 	I

	workers' for patients with vascular disease and long-term conditions associated with vascular disease.		measures =weight change, 3) participants were followed for at least three months, 4) Adults > 18 years who were overweight or obese (BMI > 25 kg/m2).		• Evidence base limited	
Smith et al. (2008a). Australia	To examine their understandings of help seeking and health service use.	Qualitative study	<ul style="list-style-type: none"> • n=36 Australian men • 35-80 years. • Semi-structured interviews • South Australia. 	4 factors of self-monitoring influence men's help seeking practices, 1) the length of time available to monitor health; 2) men's previous illness experiences; 3) how men monitor their health in relation to their ability to maintain regular activities in the context of their daily lives. 4) Perceived illness severity	<ul style="list-style-type: none"> • Australian study • Men were interested in engaging in health 	V
Stephens et al. (2014). Australia	To provide an overview of interventions to reduce or prevent overweight or obesity and improve diet or physical activity.	Systematic review	<ul style="list-style-type: none"> • 60 meta-analysis and 23 systematic reviews. • Inclusion: systematic reviews and meta-analysis of any setting or age group. 	Dietary interventions and multicomponent interventions targeting overweight and obesity appeared to have the greatest effects, particularly in comparison with workplace or technology or internet-based interventions. The effectiveness of the interventions to assist in maintaining behaviour or weight change remains unclear.	• Various settings/age groups- not specific to workplaces	I
Taylor et al. (2012). United Kingdom	To assess the effectiveness of worksite interventions designed to promote physical	Meta-analysis of experimental or quasi-experimental studies 1976 to 2009	<ul style="list-style-type: none"> • 26 studies reported 27 evaluations • n=15,062 	Random effects model produced an overall effect size of 0.21 (95% CI 0.17-0.26). Physical activity interventions were effective, but only produced small sized effects on physical activity. Significant difference in effects of interventions that varied in the extent to which the design of	<ul style="list-style-type: none"> • Theory-based interventions were more effective. • No studies were identified that used theory to inform every aspect of the design. • Gap exists between theory and practice. 	I

	activity and investigate whether 1) interventions explicitly designed based on theory are more effective, and 2) inclusion of specific behaviour change techniques improves effectiveness.			the intervention was explicitly informed by theory ($p < 0.05$).	<ul style="list-style-type: none"> • Recommendation that interventions be based on theory 	
van Sluijs et al. (2004). Netherlands	To review the literature concerning the effect of stages-of-change-based interventions in primary care on smoking, physical activity, and dietary behaviour.	Systematic review up to 2002	<ul style="list-style-type: none"> • 29 trials • Inclusion: 1) RCTs, 2) Primary care settings-intervention aimed at changing smoking, physical activity, or dietary behaviour, and stages-of-change-based outcomes, and 4) measured behavioural outcomes. 	13 studies included a physical activity intervention, 14 aimed at smoking cessation, and five included a dietary intervention. Methodological quality was good. No evidence for an effect on stages of change and actual levels of physical activity. Based on the strength of the evidence, limited effect on stages of change for smoking and smoking quit rates. Odds ratios for quitting smoking showed a positive trend. Strong evidence found for effect on fat intake at short- and long-term follow-up. Limited evidence for effect on stages of change for fat intake at short-term follow-up. Evidence for the effect of stages-of-change-based lifestyle interventions in primary care is limited.	<ul style="list-style-type: none"> • Methodological quality was good • Population description limited • Follow-up ranged from 3-14 months • Focused on interventions apply TTM • Discusses use of TTM with interventions • Highlighted misclassifications 	I
Verdonk et al. (2010). Netherlands	To explore men's health beliefs and attitudes towards health promotion; in particular, it explores workplace physical activity in	Qualitative study	<ul style="list-style-type: none"> • n=13 Dutch men employed in a range of occupations. • 23-56 years. 	Two normative themes were found: first, the ideal man is equated with being a winner and real men are prepared to compete, and second, real men are not whiners and ideally, not vulnerable.	<ul style="list-style-type: none"> • Dutch study • Relevance to male culture/beliefs related to health. 	V

	relation to masculine ideals among male employees.					
Verhagen et al. (2014). Netherlands	To explore whether community health workers are effective in improving the health and the delivery of health care services to ethnic minority older adults in Western countries.	Systematic review 2002-2012 of RCTs	<ul style="list-style-type: none"> • 7 studies • Inclusion: <ol style="list-style-type: none"> 1) RCTs 2) Interventions using community health workers 3) Sample- ethnic minorities/older adults. 	5 studies found some positive effects. No negative effects were found. Substantial effects on the access to care (mean ER = 0.58) and on health behaviour (mean ER = 0.45) were found. The mean ER for health outcomes was considerably lower (mean ER = 0.17).	<ul style="list-style-type: none"> • Community health workers were effective at improving health care use and behaviour in ethnic groups. • Older groups • Relevance for hard to reach groups. 	I
Verweij et al. (2011). Netherlands	To examine the effectiveness of workplace interventions targeting physical activity, dietary behaviour or both on weight outcomes.	Meta-analysis of studies published 1980-2009	<ul style="list-style-type: none"> • 22 studies • Inclusion: <ol style="list-style-type: none"> 1) RCTs, 2) Workplace interventions targeting PA and/or dietary behaviour 3) Outcome measure- weight- body weight, BMI, body fat percentage, waist circumference, waist-hip ratio and sum of skin-folds. 	Moderate quality of evidence that workplace physical activity and dietary behaviour interventions significantly reduce body weight (nine studies; mean difference [MD] -1.19 kg [95% CI -1.64 to -0.74]), BMI (11 studies; MD -0.34 kg m-2 [95% CI -0.46 to -0.22]) and body fat percentage calculated from sum of skin-folds (three studies; MD -1.12% [95% CI -1.86 to -0.38]). Greater effect with interventions containing an environmental component.	<ul style="list-style-type: none"> • Focus on preventing weight gain • Recommend workplace physical activity, dietary behaviour and an environmental component to prevent weight gain 	I
Wong et al. (2012).	To review the literature on workplace physical	Systematic review up to 2010	<ul style="list-style-type: none"> • 14 papers, representing 13 studies 	13 studies (10.5%) reviewed focused on men, 5 showed significant increases in physical activity.	<ul style="list-style-type: none"> • Focuses on men • Poor methodology quality 	I

Australia	activity interventions for men and to identify key issues for future intervention development.		<ul style="list-style-type: none"> • Inclusion: 1)RCTs, quasi-experimental, pre-post test, 2)healthy working men 3)workplace interventions targeting PA, improved health. 	Studies used generic, multicomponent, health promotion strategies with a variety of timeframes, self-report measures. Multicomponent, theory based interventions most effective. Highlights paucity of literature for men's workplace physical activity interventions.	<ul style="list-style-type: none"> • Highlights that interventions are needed that specifically target men through consultation at the pre-intervention and planning phases. 	
Yousaf et al. (2013). United Kingdom	To review qualitative and quantitative empirical studies on medical help-seeking factors/barriers in men.	Systematic review 1946-2012	<ul style="list-style-type: none"> • 41 studies n=21,787 participants • Age 15-80 years • Inclusion: 1)help seeking barrier or factor in men, 2) qualitative or quantitative methods 	. Most prominent barriers to help-seeking were disinclination to express emotions/concerns about health, embarrassment, anxiety and fear, and poor communication with health-care professionals.	<ul style="list-style-type: none"> • Half qualitative methodologies • Highlights barriers to men's health help seeking behaviour. 	I

2.3 Synthesis of the Literature

2.3.1 Improving Rural Men's Health

Men's health is an area of public health concern (Baker, 2002). It is well recognised that men experience health disadvantage, with higher levels of disease risk, higher rates of morbidity and shorter life expectancy than women (AIHW, 2013a). More men are overweight or obese compared to women. There is also a marked health inequality between men living under different social conditions, particularly those living in rural and remote areas (AIHW, 2013a). Moreover, men are less likely than women to seek formal help for health issues (Tyler & Williams, 2014). Given these inequalities and different behaviours, research and policy into men's health has gained momentum in recent times (Commonwealth of Australia, 2010a; O'Kane et al., 2008a). The main themes in the literature relate to barriers and motivators to improving men's health.

2.3.1.1 Barriers

Evidence suggests that there are several biological, psychological, behavioural, and systematic barriers that impact on men's health (Coles et al., 2010). Understanding the health beliefs of men is important to comprehend some of the reasons for the differences in health outcomes (O'Kane, Craig, Black, & Thorpe, 2008b; O'Kane, Craig, & Sutherland, 2008c). Several authors have focused on exploring Australian rural men's health beliefs (Heading, 2008; O'Kane et al., 2008b; Smith, Braunack-Mayer, Wittert, & Warin, 2008a). O'Kane et al. (2008b) explored the attitudes to health of 42 men living in rural Australia and identified masculine myths surrounding male behaviour in relation to health. For example men in this study perceived advantages to "being big" (p. 68) and also considered themselves "bullet-proof until something untoward" occurred to them (p.69). The role of alcohol and the cultural traditions of men drinking to excess were also highlighted. There was an ignorance expressed by men in that they would primarily be motivated to consider health issues following a health scare, were generally not willing to discuss health issues and were reluctant to seek health care. This is supported by international research conducted by O'Brien, Hunt, and Hart (2005) of 55 Scottish men, which reported the men's tendency not to disclose emotions as they were "not supposed" to talk about them and should cope with their emotions on their own. This study found that men, particularly younger men, were reluctant to seek help for what they considered "minor" complaints. These findings provide important information to help assist with effective health education that takes into consideration men's attitudes about health.

The literature suggests that men who adopt a traditional masculine role often engage in risky health practices (Mahalik, Burns, & Syzdek, 2007) and are less receptive to health promotion and health services (Addis & Mahalik, 2003; O'Brien et al., 2005; O'Kane et al., 2008b). Verdonk, Seesing, and de Rijk's (2010) study of 13 male employees aged 23-56 years explored men's health beliefs and attitudes towards health promotion, specifically in relation to workplace physical activity and masculine ideals. Two main themes were found that related to men's health beliefs and influenced their perception of workplace physical activity: firstly, the *ideal* man is equated with being "a winner and real men are prepared to compete", with competitiveness towards health being shaped by masculine ideals; secondly, that "real men are not whiners and ideally, not vulnerable". Although this is a small study from the Netherlands, the findings offer some relevance for planning health interventions and highlight the need to consider gendered backgrounds of lifestyle behaviours, and also how masculine traits influence the perception of health interventions.

Galdas, Cheater and Marshall's (2005) non-systematic review concluded that male socialisation, such as masculine views of reliance and strength, have a role in shaping attitudes that are detrimental to help seeking behaviours. Mahalik et al.'s (2007) American study of 140 men explored the social norms of masculinity and found that men scoring higher on masculinity reported lower frequencies of health promoting behaviours ($p < 0.001$). These masculinity traits were also evident in Buckley and O'Tuama's (2010) study of 18 men that explored help seeking behaviours related to skin cancer. There was a reticence to engage in health seeking behaviours and, furthermore, participants considered that health seeking was not associated with male reliance and seen as more of a feminine trait. It has been suggested that these masculine traits are stronger among rural men than their metropolitan counterparts (O'Kane et al., 2008b; O'Kane et al., 2008c). Despite a sizable number of studies that have explored masculinity and its relationship to health seeking behaviours, there is a paucity of literature that attempts to explain the reasons or processes involved (Galdas et al., 2005; Yousaf, Grunfeld, & Hunter, 2013).

There is evidence to suggest that this 'traditional' view of masculinity and health is a minority view and that most Australian men are actively involved in monitoring their health and make decisions about seeking help based on the perceived severity of the health issue (Smith et al., 2008a). Previous research has focused on the men's apparent reluctance to seek help. Smith et al. (2008a) challenged this notion in their qualitative study of 36 Australian men. The study explored the men's perspectives of self-monitoring prior to seeking help and suggested that men monitored their health status and gathered information about their health concerns in order to make conscious, informed decisions about when and how to seek help. Self-monitoring was central to how men interpreted the need to seek help and has important

implications for understanding how health planners can promote men's health and interaction with healthcare services. Further to this, Smith (2007) recommended that in order to target some of the most vulnerable men (particularly men in blue-collar occupations) there is a need to accept a range of masculine traits.

A qualitative study by Kolmet et al. (2006) of Australian male blue-collar workers (n=48), indicated that although the concept of masculinity and gender specific roles continues, it is becoming increasingly acceptable for men to be concerned about their health. Men in this study were willing to discuss their roles as men and how they might improve their health. Kolmet et al. (2006) suggested that although male blue-collar workers often have lifestyles that may imply that they do not care about their health, they are a reflection of work and life commitments, rather than ignorance. This study highlighted that health services and health promotion messages need to take into consideration the complexities surrounding lifestyles to optimise the chance for sustainable improvements in the health of these men.

A number of other systematic barriers have been identified that prevent men from accessing health services: lack of time, poor access opportunities, restricted opening hours, inappropriate services or "not male friendly" services, and lack of information about when and who to visit in terms of health providers (Banks, 2001; Coles et al., 2010; Commonwealth of Australia, 2010b; Yousaf et al., 2013). These factors have been identified as having a greater influencing on men, rather than blaming 'traditional' stereotypical male or masculine behaviours (Banks, 2001; Commonwealth of Australia, 2010b), and have important implications for improving the use of existing health services by men.

A systematic review by Yousaf et al. (2013) of factors associated with delays in seeking help among men identified psychological, health service related and contextual factors as influencing this. Lack of time to monitor and seek help was identified as a factor impeding men to access health services. This echoed research specific to Australian men by Smith et al. (2008a) and Aoun and Johnson (2002b) who acknowledged lack of time as a recurring concern for men.

Other health service related barriers emerged in Coles et al.'s (2010) study of 82 middle aged to older men. Although masculine culture exerted pressure on perceptions of health, contrary to stereotypes, men in this study were keen to engage with health care services, but lacked those that were appropriate and accessible. Access to services was identified as problematic and long waiting times were seen to discourage men. Restricted opening hours were reported as a barrier and some men indicated that they could not take time off work to see health professionals. Furthermore, men wanted regular check-up opportunities, similar to those offered to women. Buckley and Lower (2002) found that rural men who were older were

more likely to attend services for preventative purposes and have check-ups. In contrast, Johnson, Oliffe, Kelly, Galdas, and Ogrodniczuk (2012) in a study of 38 younger men with depression found that they were not interested in regular check-ups and were likely to seek health advice when acutely unwell, which supports the work of others related to delays in help seeking (Buckley & Lower, 2002).

The study of Western Australian men by Buckley and Lower (2002) applied participatory action research to identify factors that influence health service use by rural men. Focus groups with 71 rural men, a health forum with a further 106 men and 289 who returned postal surveys (response rate 31%) were used to identify factors as predictors of health service use. Similar to the barriers identified by Coles et al. (2010), this study found that long waiting times were also a significant barrier ($p = 0.022$). Some other barriers for these rural men included long working hours ($p = 0.03$), the requirements of seasonal work ($p = 0.001$) and privacy issues ($p = 0.004$).

A main limitation to improving men's health is lack of knowledge and therefore, lack of perceived severity of health issues (Commonwealth of Australia, 2010b; Coles et al., 2010; Egger, 2000). There is evidence to suggest that lower levels of health literacy can be attributed to poorer health outcomes (Johnson, Huggard, & Goodyear-Smith, 2008; Peerson & Saunders, 2011; Schwartzberg, van Geest, & Wang, 2005). The AIHW (2010) reported that in 2006, men living in regional and remote areas were up to 22 percent less likely than their counterparts in major cities to possess an adequate level of health literacy (AIHW, 2010). Men are also reportedly less likely to access, interpret and apply information to improve or maintain their health compared to women (AIHW, 2010; Galdas et al., 2005). Despite this, there is a paucity of literature that examines the relationship between health literacy and men's health outcomes, particularly in Australia (Nutbeam, 2008; Peerson & Saunders, 2009; Peerson & Saunders, 2011). The Australian Men's Health Policy recognises this and has a focus on building up the health literacy of men, by raising awareness of preventable diseases and injuries, as a key way to improve health outcomes (Commonwealth of Australia, 2010c).

Donovan and Egger (2000) suggest that men prefer not to know about unobvious health problems and are more likely to focus on physical problems than mental or emotional issues (Smith, Braunack-Mayer, & Wittert, 2006). It has been argued that men have a "functional view" of their bodies and respond to facts and figures (Peerson & Saunders, 2011; Robertson, Douglas, Ludbrooke, Reid, & van Teilingen, 2008). Courtenay (2004) suggests that expecting men to engage in preventative health when they are asymptomatic may be optimistic, especially given the influence of gendered norms on men's health (Aoun, Donovan et al., 2002; Peerson & Saunders, 2009). Therefore, it is important to understand how to effectively

communicate health information to men (Smith, Braunack-Mayer, Wittert, & Warin, 2008b). Once alert to more obvious “fixable” problems, such as seeing overweight or obesity as a number than can be targeted, knowledgeable men may become more interested in other aspects of their health (Egger, 2000; Robertson et al., 2008). However, men need concrete advice on how to translate knowledge into action in order to make changes to their health (Aoun, Donovan et al., 2002; Donovan & Egger, 2000; Smith et al., 2006) and prefer to learn in informal settings, that are less structured, local and on-site, where they feel comfortable (Misan & Sergeant, 2009). Men also need information that they can easily relate to (Commonwealth of Australia, 2010a). However, while men can be knowledgeable about health, they often don’t follow health advice (Commonwealth of Australia, 2010c; Egger, 2000). Therefore, if health education is to be adopted by men, it needs to be delivered in a way that “reaches” them and ongoing follow-up is essential to bring about and sustain change (Commonwealth of Australia, 2010c, p.20).

Research conducted in rural Australia has identified several barriers and challenges to healthy lifestyle adoption (O’Kane et al., 2008c; NRHA, 2013). Barriers include lack of time, motivation, limited access to healthy food options, and sporting facilities. Other barriers are considered cultural, such as the belief that ‘rural work’ provides sufficient physical activity and therefore not necessary to perform physical activity outside of work hours. Furthermore, rural men also have limited access to health professionals who could potentially provide support and encouragement for the adoption of healthy lifestyles (NRHA, 2013). Barriers to healthy lifestyle adoption (specifically physical activity and healthy diet intake) by rural men were explored in O’Kane et al.’s (2008c) mixed method study of 529 men in rural Australia. This study examined barriers related to diet and physical activity. The findings suggest that lack of willpower, lack of time, tiredness and long hours in sedentary jobs were considered the major barriers to undertaking physical activity and eating a healthy diet for these rural men. This is similar to the findings of Blackford, Jancey, Howart, Ledger, and Lee’s (2013) study of office based workers in WA, where the most common barriers were being “too tired” and ready “access to unhealthy food”.

2.3.1.2 Motivators

Much of the literature related to men’s health has focused on negative aspects including men’s underutilisation of preventive care and its causes (Williams, 2003), and how their health-related beliefs and behaviours contribute to this (Holland, Bradley, & Khoury, 2005). There is a gap in literature that focuses on what motivates men and how best to promote men’s health. A Western Australian study by Aoun and Johnson (2002b) of 525 rural men investigated the

extent that men could be motivated to change their lifestyle. The most frequent factor preventing men from seeking help when they have a health problem was the lack of recognition of its seriousness. They found that the extent of motivation was not related to whether they visited their doctor or not, and regardless of their level of motivation to improve their health; seeking health advice was strictly to determine the presence or absence of disease. This is consistent with the perception that men do not seek preventative health information, rather mainly seek help for acute health problems (Donovan & Egger, 2000).

Currently in Australia, there is limited literature relating to Australian men's identification of their health needs. Fletcher, Higginbotham, and Dobson (2002) conducted a cross sectional survey in Australia describing health priorities and perceived needs of men (n=392). The findings suggested that men perceived a wide range of health and social problems to be important; 84 percent nominated three health problems of concern with prompting. The most frequently reported conditions for men were stress, tiredness, back problems, overweight and lack of exercise. Interestingly, there is a direct relationship between all of these concerns. The men also expressed that although some issues had been addressed with health promotion activities, more could be done.

Another Australian study by Heading (2008) explored motivation for change related to obesity for people (female n=13, male n=6) in remote NSW. The findings suggested a variety of motivators to change habits for weight loss, such as diagnosis of disease, disease risk minimisation, desire to be happy and healthy, family, and being fit to participate in sport or work. Although the findings are not specific to men only, they do suggest that interventions targeting obesity need to consider that health is not the only motivator for weight loss and that strategies need to incorporate goal setting, being realistic and focus on individual experiences.

Robertson et al.'s (2008) systematic review identified that despite a plethora of literature, there was limited empirical evidence on how to improve the uptake of services for men. It was evident that gender is not factored into the design and evolution of prevention health programs. The review identified only 27 relevant studies. Of the interventions for men many were sex specific rather than gender sensitive, that is, they focused on diseases unique to men such as prostate cancer. Noteworthy, was the lack of interventions specifically designed for men only: only three were reported. Although some interventions targeted men in terms of location (male dominated workplaces or sports clubs) they were not necessarily designed for men specifically. This review was inconclusive about the effectiveness of targeting men compared to providing services for all.

In the last two decades there has been increased attention on men's health including how men perceive health (Fletcher et al., 2002; O'Kane et al., 2008b; Robertson, 2007), how

men identify the need for and seek health advice (Galdas et al., 2005; O'Brien et al., 2005; Smith et al., 2008a) and how men respond to health interventions and services (Aoun, Donovan et al., 2002; Buckley & Lower, 2002; Robertson et al., 2008; Yousaf et al., 2013). Despite the extensive amount of literature related to men's health there remains a lack of information specific to men in rural Australia, although authors investigating rural men's health have suggested that many studies investigating urban men have findings transferrable to the rural setting. Even though there has been much research and numerous health interventions targeting men, large health disparities continue. Moreover, it is evident that there are clear gender differences in the way men and women respond to health interventions, but gender is often not factored in (Robertson et al., 2008; Verdonk et al., 2010). It is apparent that if health interventions are to be effective at targeting men, there is a need for a more positive focus on men's health research (Smith et al., 2008a).

2.3.2 Health Interventions to Address Obesity

It is evident in the literature that efforts have been made to engage men in preventative health care (O'Kane et al., 2008a; Heading, 2008, Smith et al., 2008a; Smith et al., 2007). Internationally, there have been a number of generic health interventions that have been tailored specifically to men. This section will explore the components of health interventions aimed at reducing obesity. It will examine the literature related to the effectiveness of workplace interventions, stage-based interventions and finally specific self-management interventions targeting obesity that are relevant to rural Australian men.

2.3.2.1 Health Intervention Components

There has been much debate about the effectiveness of components of interventions and whether singular or multicomponent approaches are more effective. Kirk, Penny, McHugh, and Sharma (2012) conducted a review of systematic reviews (n=10), meta-analytical reviews (n=6) and non-systematic reviews (n=9) of approaches to management of obesity in adults. They concluded that multicomponent interventions were an evidence-based approach to obesity management in adults, which is reflected in international obesity guidelines (NICE, 2006; SIGN, 2010). It was also concluded that interventions need to be tailored to individuals and implemented over the long-term. In contrast, single component interventions are effective in improving behaviour, but not in achieving weight loss.

Shaw, Gennat, Hann, O'Rourke, and Del Mar (2006) conducted a systematic review and meta-analysis of 36 studies of 3495 participants and found that multicomponent interventions (behaviour or cognitive behaviour therapy in conjunction with diet and exercise) compared to two component interventions (diet and exercise alone) increased weight loss achieved by up to an additional 4.9 kilograms (95% CI -7.3 to -2.4) in adults. Shaw et al. (2006) also found that increasing the intensity of behavioural interventions (more behavioural strategies, more frequent clinical contact, or longer duration of intervention) the effectiveness of the intervention was increased, however only one of the reviewed studies was greater than 12 months duration.

A review of health interventions by Goldgruber and Ahrens (2010) noted that of 17 reviews covering 71 interventions, 69 percent demonstrated evidence of effectiveness, while no evidence was found for the remaining 22 interventions (31%). It was evident that singular interventions showed limited effectiveness. The findings are similar to Kirk et al. (2012) and Shaw et al. (2006) in that the greatest effect was achieved by multicomponent interventions. However, this is not without problems. It is well recognised in the literature that multicomponent interventions are more complex and difficult to evaluate (Goldgruber & Ahrens, 2010; Michie, Abraham, Whittington, McAteer, & Gupta, 2009). This is supported by Michie et al. (2009) who suggested that identifying the individual effect of aspects of multicomponent interventions is difficult. They conducted meta-analysis to examine specific intervention content effectiveness. The study specifically recognised self-management approaches and focused on active interventions that engaged participants, rather than passive interventions (e.g., simply providing information). Of the 122 evaluations included, it was evident that those that involved self-monitoring, and at least one other self-regulation technique, were more effective than those without self-monitoring. This was the case for interventions designed to promote physical activity and healthy eating (pooled effect sizes for healthy eating: 0.54 versus 0.24; physical activity: 0.38 versus 0.27; all interventions: 0.42 versus 0.26). Michie et al. (2009) also suggested that interventions based on behaviour change theory are more effective than other interventions (0.42 versus 0.26). The findings support the inclusion of self-monitoring, goal setting and providing feedback on performance in interventions designed to promote healthy eating and physical activity.

Greaves et al. (2011) found similar results in their systematic review of interventions associated with improving diet and physical activity. Increased effectiveness was also associated with increased contact frequency and applying self-management behaviour change techniques (e.g., goal-setting, self-monitoring, providing feedback on performance). Dissimilar to Michie et al. (2009), this review suggested no particular minimum frequency of contact for effectiveness. The findings suggested that interventions that targeted both physical

activity and diet typically generated significant and clinically meaningful changes in physical activity (typically equivalent to 30-60 minutes of walking per week, for up to 18 months) and weight loss (typically 3-5 kg at 12 months, 2-3 kg at 36 months). Although covering a variety of settings where the populations were not specifically identified, this study's findings provide clear suggestions regarding components of interventions to improve effectiveness.

The long-term effectiveness of many interventions targeting obesity remains unclear. Many studies (Benedict & Arterburn, 2008; Groeneveld, Proper, van der Beek, Hildebrandt, & van Mechelen, 2011; Kirk et al., 2012; Shaw et al., 2006) have critiqued interventions for being of short duration (generally less than six months). A systematic review by Brown et al. (2009) revised the long-term effectiveness of lifestyle interventions (n=40) for the prevention of weight gain. Of 39 RCTs, only one produced significant improvement in weight between groups at two years or longer with a mean difference ranging from -0.5 to -11.5 kilograms. Diet with exercise and/or behavioural therapy demonstrated the most effective improvements over the long-term. Dissimilar findings were reported by Douketis, Macie, Thabane, and Williamson (2005) systematic review of 44 long-term (greater than two years) studies investigating dietary/lifestyle and other weight loss methods. They found that diet and lifestyle therapy provided only modest weight loss (< 5kg) compared to pharmacological and surgical therapy.

Stephens, Cobiac, and Veerman (2014) recently reviewed interventions aimed at preventing obesity through improved diet and physical activity. This broad review examined systematic reviews (n=23) and meta-analyses (n=60) across various settings and age groups. As per others work (Goldgruber & Ahrens, 2010; Kirk et al., 2012; Shaw et al., 2006), they found that dietary interventions and multicomponent interventions targeting obesity appeared to have the greatest effects. Furthermore, the diet-based interventions appeared to have a greater effect on weight loss than exercise-based interventions, which were highly variable. Policy interventions were reviewed but, due to quality of the studies, it was reportedly too difficult to ascertain the impact at a population level. Stephens et al. (2014) noted a lack of community based approaches and suggested the need to move beyond a reliance on RCTs for evaluation of targeted interventions.

Interventions led by lay persons (named Lay Health Advisors, Lay Leaders, Natural Helpers in the literature, and Champions in this study), are becoming increasingly prominent as they are recognised as an effective strategy for health promotion and chronic disease self-management at the community level (Aoun et al., 2013a; 2013b; Eng, Rhodes, & Parker, 2009; Foster, Taylor, Eldridge, Ramsay, & Griffiths, 2009; Lorig, Hurwicz, Sobel, Hobbs, & Ritter, 2005). Interventions that utilise Lay Health Advisors are considered culturally suitable

approaches to health promotion, which build on existing community strengths and resources (De Bate & Plescia, 2005; Fleury, Keller, Perez, & Lee, 2009).

Recent reviews of lay or community health workers have been conducted (Fleury et al. 2009; Rhodes, Foley, Zometa & Bloom, 2007; Verhagen, Steunenberg, De Wit, & Ros, 2014). There is evidence to suggest the effectiveness of Lay Health Advisors for encouraging appropriate health care utilisation, immunisation, smoking cessation, cardiovascular health behaviours and health screenings. Most of the literature involving Lay Health Advisors tends to target minority, ethnically diverse, underserved or hard-to-reach population groups including African American women, older adults, low income men or women and migrants. Few are holistic or relevant to Australian men.

Fleury et al. (2009) reviewed 20 articles to examine the roles, evaluation, and effectiveness of Lay Health Advisors in community based interventions that focused on reducing risk factors for CVD. In the majority of studies, advisors were matched by gender, race, and ethnicity to the target population. They found that details on advisors' role components and expectations were limited and varied. Health outcomes varied in length from six to 36 weeks and focused on measures such as weight loss, reduction in blood pressure and cholesterol levels. Results demonstrated that interventions with Lay Health Advisors lead to significant positive outcomes in the short-term; however, due to the heterogeneity of the studies reviewed makes it difficult to draw conclusions about overall effectiveness.

Rhodes et al.'s (2007) qualitative, systematic review of 37 studies of Lay Health Advisor interventions targeting health promotion and disease prevention found that, despite using advisors in health promotion, there is a lack of empirical evidence on the effectiveness of Lay Health Advisors. Six key roles of Lay Health Advisors were: supporting participant recruitment and data collection, serving as health advisors and referral sources, distributing materials, being role models, and advocating on behalf of community members. Fourteen studies found evidence of effectiveness (although only 12 used a control group) and, as per Fleury et al.'s (2009) findings, follow-up was limited. None of the studies specifically targeted men and it was reported that there is a lack of male-focused Lay Health Advisor interventions generally. Although the review focused on the Hispanic/Latino community in America, the findings suggested that Lay Health Advisor interventions may be more effective with men, generally, than women.

A systematic review by Verhagen et al. (2014) of seven RCTs of community health worker interventions targeting older adults from ethnic minorities, found, in five of those studies, that the interventions improve health care use (mean effects ratio= 0.58), health behaviour (mean effects ratio= 0.45) and to a lesser extent, health outcomes (mean effects ratio

= 0.17). Negative effects were not found in any of the studies, which primarily focused on ethnic minority groups of women in America.

There are a lack of systematic reviews and high quality studies that focus on interventions using Lay Health Advisors to target men, particularly in rural Australia. One study by Aoun et al. (2013b) applied a Lay Health Advisor based health promotion intervention to a wider target group. The study, previously described as *The Rotary 'Waist' Disposal Project*, targeted middle aged to older men in service clubs in rural WA. Ninety-three Lay Health Advisors, or Champions, were trained to deliver the health intervention to 1100 peers. The Champions attended a one day training session and were then responsible for delivering education sessions and conducting a monthly weigh-in competition. They found that Champions were effective at increasing the reach of health promotion and fostered the existing, supportive peer network. The study demonstrated that Champions could be used to influence the uptake and success of health interventions by men in rural WA.

2.3.2.2 Effectiveness of Workplace Interventions

The workplace has been clearly identified internationally as a suitable setting to deliver health promotion. Consistent with the benefits that have previously been described for both employees and employers, interventions targeting behaviours for a healthy lifestyle have been implemented in a variety of workplace settings. The outcomes of these studies have had various effects (Hutchinson & Wilson, 2011). Systematic reviews and meta-analyses have been applied to synthesise the results in terms of effectiveness. It is evident from most of these that generally only small effects have been achieved. The effectiveness of interventions is often related to the types of interventions and target populations. A recent meta-analysis of workplace health promotion by Rongen, Robroek, van Lentge, and Burdorf (2013) investigated the influence of population characteristics, intervention content and study quality on the effectiveness of interventions. It identified 18 studies (two Australian) describing 21 interventions which illustrated a small overall effect ($ES=0.24$, 95% $CI=0.14, 0.34$). The findings demonstrate that the effectiveness of workplace health promotion programs depends on the study population, methodology of the study and intervention content. Specifically, it was found that studies of mostly white-collar workers demonstrated a larger effect, and suggested that workplace interventions might be better tailored to these groups. Similar to Greaves et al.'s (2011) findings, interventions with more regular contact (e.g., weekly) were more effective. Interventions with a counselling component and individual advice were found to be less effective.

Despite the well-known health disparities between social classes, it is evident that many workplace health interventions have focused on white-collar rather than blue-collar occupational groups (Engbers et al., 2005; Montano, Hoven, & Siegrist, 2014; Rongen et al., 2013). Although highlighted by Rongen et al. (2013) and Greaves et al. (2011) that interventions targeting blue-collar workers are less effective, Montano et al. (2014) suggest that it is essential to target those who are most in need. Montano et al. (2014) recently conducted a meta-analysis of the socioeconomic positions considered in RCTs of workplace interventions. Findings from the 36 studies revealed a small, but significant effect on relevant health outcomes; however, only a few were conducted in organisations consisting of employees from low socioeconomic groups. Although the authors acknowledge that prioritisation of intervention activities need to target lower socioeconomic groups, they did not offer justification for this. Furthermore, they noted that targeting occupational groups (such as blue-collar workforces) with high needs remains largely unmet and that future research into worksite health should consider social determinants of health.

There have been several authors that systematically reviewed the literature related to worksite health promotions programs (Engbers et al., 2005; Robroek, van Lenthe, van Empelem, & Burdof, 2009; Verweij, Coffeng, Van Mechelen, & Proper, 2011). Engbers et al. (2005) presented the results of a systematic review on the effectiveness of worksite health promotion programs with environmental modifications. The main outcomes explored were, impact on physical activity, diet and related health risk. Thirteen studies met the inclusion criteria and were a mix of blue and white-collar workers. All interventions contained multiple components, consisting of a blend of education, incentives, counselling and environmental modification. The study concluded that strong evidence was found for an intervention effect on dietary intake, whereas the evidence was inconclusive for physical activity. Health risk indicators consisted of cholesterol levels, blood pressure and BMI, however no evidence regarding effectiveness was identified. Although the study reviewed only a small number of RCTs (n=13), the findings suggest that worksite environmental changes do have the ability to influence diet and physical activity, which is supported by Verweij et al.'s (2011) meta-analysis of 22 studies of workplace interventions targeting physical activity and diet. There was a reported significant decrease in weight of -1.19 kilograms [95% CI -1.64 to -0.74] and BMI (11 studies; mean difference -0.34 kg/m² [95% CI -0.46 to -0.22]), and subgroup analyses showed a greater reduction in body weight (additional -0.29kg) for interventions containing an environmental component. It can be concluded that interventions containing an environmental component should be considered, although it has been noted in Groeneveld et al.'s (2011) RCT of 816 men in the construction industry, that establishing environmental

changes in blue-collar industries can be problematic due to the variable work locations and diverse settings of many workers.

Research has extensively focused on the effectiveness of interventions targeting particular health outcomes. However, there is a need to understand what influences participation rates. Robroek et al. (2009) conducted a systematic review of participation in worksite health promotion programs. Of the 23 studies examined, participation rates varied from 10-64 percent, with a median of 33 percent (95% CI 25–42%). Men's participation rates were generally lower than women and greater participation was seen in younger age groups. Lower participation rates for men were not seen in programs that offered access to fitness centres. Moreover, multicomponent interventions were recommended, as it was suggested that mismatched interventions were less likely and the use of incentives was suggested as being beneficial. Robroek et al. (2009) concluded that although participation rates in workplace interventions were typically low, there are strategies that can be applied to increase involvement.

2.3.2.2.1 Targeting Weight Loss

Recent reviews have described the impact of worksite interventions on weight loss (Anderson et al., 2009; Benedict & Arterburn, 2008; Groeneveld, Proper, van der Beek, & van Mechelen (2010). A systematic review by Anderson et al. (2009) of the impact of nutrition and physical activity programmes on employee weight found modest improvements at the six to 12 months follow-up. A pooled effect equivalent of -1.3 kilograms was found for nine RCTs (95% CI -2.1 to -0.45) and in terms of BMI, a net loss of 0.47kg/m² at six to 12 months was apparent in six RCTs (95% CI -0.8 to -0.2) compared with controls. The review reported that worksite interventions are cost effective and have the potential to improve employee productivity and reduce health care costs. Although the review was not specific to men, it was evident in the 47 studies that more intensive modes of intervention appeared to improve the program impact. Offering structured programs (i.e., scheduled sessions) was found to be more effective than unstructured approaches. Furthermore, multicomponent interventions were more effective than programs with fewer components. The review also explored program effectiveness based on lay versus professional group leaders and found no apparent differences. The review was unable to determine the separate effects on blue and white-collar workers, as many (40%) of the studies lacked this information. However, of those that did report occupational status, it was again evident that they included predominately white-collar workers. The results were limited to studies published up until 2005 and focused on weight loss only, rather than prevention in general.

Benedict and Arterburn's (2008) systematic review of worksite based weight loss programs identified 11 studies, most of which focused on education and counselling to improve diet and physical activity. Of the studies reported, only one was Australian and focused on middle-aged, overweight men. Regrettably, key information about the interventions was often limited and despite the studies being RCTs, there was a lack of methodological quality. The follow-up period ranged from two to 18 months and intervention groups lost significantly more weight than controls with mean differences ranging from -0.2 to -6.4 kilograms; however, the long-term effect is unknown. This highlights that worksite weight loss programs can at least result in modest short-term reductions in body weight.

Another systematic review by Groeneveld et al. (2010) investigated the effect of lifestyle interventions in the workplace. Of 31 RCTs examining a range of interventions, including counselling, group education or exercise, they found strong evidence for a positive effect on body weight among populations "at risk". They also noted that the "at risk" population appeared to benefit more from the lifestyle interventions than mixed populations.

Of the prevention studies which reviewed weight loss versus weight gain, there was a difference in focus, population, length of time and outcomes measures. A small systematic review (n=9) by Gudzunne, Hutfless, Maruthur, Wilson, and Segal (2013) suggested that weight loss studies often aim to achieve a weight loss over a relatively short period of time, whereas weight gain prevention studies may prevent the development of obesity over a longer-term. They highlighted that measuring prevention of weight gain requires studies of greater than 12 months, however this is a major limitation of most of the studies reviewed.

A gap in many of the reviews is the lack of consideration for the impact of theory on workplace health interventions. Hutchinson and Wilson (2011) conducted a meta-analysis of workplace interventions that concentrated on promoting physical activity and dietary changes that focused on the theoretical frameworks applied to 29 relevant studies. Only a small number of these examined the same outcome measures using common theoretical approaches. Generally, the effect size was small, however interventions that applied motivational enhancement such as motivational interviewing were found to have large effect sizes (mean $d = 1.98$). Again, the achievements were noted to be only short-term, and a need to undertake research as to whether changes are sustained in the longer-term. Another meta-analysis by Taylor, Conner, and Lawton (2012) explored whether interventions designed based on theory were more effective and whether including behaviour change techniques improved effectiveness. Twenty-seven evaluations were included in the meta-analysis which found that interventions using theory more explicitly were more effective, producing an effect size of 0.34 (95% CI 0.23, 0.45; $I^2 = 0\%$). Dissimilar to others, Hutchinson and Wilson (2011) found

that there were no significant difference in effect sizes between studies that used behavioural change techniques and those that did not.

2.3.2.2.2 Targeting Physical Activity

Worksite health interventions have been identified as not only an effective way to target hard to reach groups, but also a way to overcome some of the key barriers in adopting healthy lifestyles, such as time, that have been identified in the literature (Abrahams & Graham-Rowe, 2009; Dugdill, Brett, Hulme, McCluskey, & Long, 2007). Despite the reported benefits of a more physically active workforce, there remains uncertainty on the types of workplace interventions that are effective at inducing and maintaining physical activity behaviours. Furthermore, focusing on weight alone is reportedly a limitation in measuring the effectiveness of an intervention; due to the potentially large lag time between changes in this outcome following an intervention (Hutchinson & Wilson, 2011). Physical activity and diet are important components in achieving and maintaining a healthy body weight (Ni Mhurchi, Aston, & Jebb, 2010). Research has been undertaken on the effectiveness of targeting physical activity through workplace interventions. Despite extensive systematic reviews and meta-analyses in this area, most use different inclusion criteria, across various setting and populations, resulting in inconclusive results. Applying a systematic review and meta-analysis, Abraham and Graham-Rowe (2009) assessed 37 interventions and reported that worksite interventions have small, positive effects on physical activity. It is important to note that the effect was smaller when fitness, as opposed to when self-report outcome measures were adopted. A systematic review by Proper et al. (2003) of 26 studies concluded that there was strong evidence of a significant intervention effect for physical activity. However, it is important to note that this was made on the basis of only two high-quality studies (both RCTs).

Similarly to the work of Proper et al. (2003), a review by Dugdill, Brett, Hulme, McCluskey, and Long (2008) suggested strong, growing evidence that workplace physical activity interventions are effective in promoting increased activity levels. The findings suggested that promoting walking is particularly successful and similar to Greaves et al. (2011) and Michie et al.'s (2009) goal setting and self-monitoring, which were identified as effective behaviour change techniques. Additional to this review, Dugdill et al. (2007) explored barriers and motivating factors for interventions that aimed to increase physical activity that were workplace based or initiated by an employer. Loss of interest and lack of time were identified as the main barriers related to undertaking physical activity. Facilitators included: location of exercise settings, as convenience was considered important; encouragement from employers; and practical changes to inspire physical activity at work (e.g., bicycle parking, lunch-time classes).

A meta-analysis by Conn, Hafdahl, Cooper, Brown and Lusk (2009) of 138 studies (n=38,231) of physical activity interventions in the workplace found that some outcomes could be improved. Physical activity improved significantly, although the effect size was small ($d = 0.21$); physiological markers were also impacted positively (lipids, $d = 0.13$) (Conn et al., 2009). Another meta-analysis by Conn, Hafdahl, and Mehr (2011) of 358 reports, including 99,011 participants, summarised the effects of non-workplace specific interventions designed to increase physical activity among healthy adults. Interventions designed to increase physical activity were moderately effective and those that were most effective were behavioural (rather than cognitive), face-to-face, and targeted individuals rather than communities. Although the focus was not strictly on workplace interventions, the findings have implications for the delivery of programs focusing on promoting physical activity.

Maintenance and long-term adherence to adequate levels of physical activity are essential to achieve sustained health benefits. A clear limitation of many studies of workplace interventions is the short time-frame of follow-up. Research has demonstrated that most interventions have at least some impact in the short-term; however, over the longer-term, sustained impact is unclear. Müller-Riemenschneider, Reinjold, Mocon, and Willich's (2008) systematic review of 25 RCTs with the duration of intervention, or follow-up, of at least 12 months, demonstrated evidence for long-term increases in physical activity and fitness. The maximum duration was only 24 months, therefore the longer-term sustainability is unknown. Whilst it was reported that a moderate decline in physical activity occurred between early and late follow-up, the reported intervention effects were mostly stable. The findings also suggested that booster interventions such as phone or mail can assist with maintaining longer-term effectiveness of interventions; however, the effectiveness or efficiency of the mode of booster interventions remains unclear.

A recent systematic review by Malik, Blake, and Suggs (2013) of 58 workplace interventions focusing on physical activity, found that there is some evidence to suggest that physical activity levels can be increased by workplace interventions. However, the, often poor, methodological quality of reported studies means that it is difficult to draw clear conclusions. It is evident that there was a lack of long-term evaluation (greater than six months) in most of the studies reviewed. Of those that did report longer-term follow-up, high attrition rates were also noted. Although the findings were inconclusive, Malik et al. (2013) did recommend the need for future research to identify which elements of workplace physical activity interventions are most likely to increase efficacy and adoption within the workplace setting, and to explore the long-term sustainability of outcomes.

Despite the extensive volume of literature that examines workplace health initiatives particularly focusing on physical activity interventions there is a lack of literature that examines these interventions specifically for men. Evidence suggests that men have tended not to engage in workplace interventions and consequently study samples tend to be underrepresented by men (Waters, Galichet, Owen, & Eakin, 2011; Wong, Gilson, van Uffelen, & Brown, 2012). Recent reviews of workplace physical activity interventions have lacked specific information on gender differences or preferences (Abraham & Graham-Rowe, 2009; Conn et al., 2009; Dugdill et al., 2008). Wong et al. (2012) attempted to address this gap with their systematic review of 13 studies focusing on men. These targeted a range of behaviours and applied a combination of strategies, finding that only 40 percent reported significant increases in physical activity as a result of the interventions. Similar to the work of others (Michie et al., 2009; Taylor et al., 2012), it was suggested that the adoption of theories and models may provide benefit to planning and designing interventions. It was evident that few studies focus on workplace interventions for men only and highlight an important gap in the existing literature.

2.3.2.2.3 Targeting Dietary Behaviours

An extensive body of research has been undertaken in relation to promoting weight loss and increasing physical activity in the worksite, but much less is known regarding the effects of such interventions on dietary intake. A review by Ni Mhurchu et al. (2010) of the effectiveness of workplace health initiatives on employee diets identified 16 studies, 50 percent of programmes being focused on employee education, and the remainder targeted change to the worksite environment either alone or in combination with education. Worksite interventions led to positive changes in fruit, vegetable and total fat intake and they found strong evidence for their effectiveness related to reducing fat intake. The study failed to define the study population and therefore it is difficult to generalise the findings.

Similar findings were identified in Maes et al.'s (2011) systematic review of workplace interventions that promoted healthy diet. Of the 30 European studies that were identified, only 17 focused solely on nutrition, with the remainder also promoting physical activity. Moderate evidence of effect was reported for educational and multicomponent dietary interventions on dietary behaviours and potential determinants of such behaviours.

Reviews have reported that workplace environmental and education interventions including diet, physical activity and other lifestyle factors modestly improve dietary quality (Maes et al., 2011; Ni Mhurchu et al., 2010). A systematic review by Geaney, Kelly, Greiner, Harrington, Perry, and Beine (2013) focused on dietary modifications only, or in conjunction

with nutrition education where the food choice offered had changed in the work environment during the intervention. All studies used self-reported dietary assessments and reported a small, but positive, increase in fruit and vegetable intake. Evidence for the effectiveness in reducing fat intake was inconclusive, which is dissimilar to Engbers et al. (2005) and Ni Mhurchu et al. (2010), who found strong evidence for the effectiveness of workplace interventions in this regard. This variation in results may be due to the different inclusion criteria and heterogeneity of interventions viewed.

2.3.2.3 Effectiveness of Stage-Based Interventions

There have been many health interventions designed and implemented without the explicit reference to any theory; however, there is evidence to suggest that the overt use of theory has the potential to significantly improve the effectiveness of the intervention (Nutbeam & Harris, 2004). One of the most commonly adopted theoretical frameworks for behaviour interventions is the TTM (Hutchinson, Breckon, & Johnston, 2009). Stage-based approaches to behaviour change have received widespread attention and have been applied to address various behaviours including physical activity, diet, cigarette smoking, and stress management (Adams & White, 2005; Riemsma et al., 2002). However, there has been a debate on whether stage-based interventions are more effective non-stage-based interventions (Adams & White, 2003; Riemsma et al., 2002).

A systematic review conducted by Adams and White (2003) explored the effectiveness of stage-based interventions. Of 26 papers describing 16 TTM based activity promoting interventions, the most commonly reported interventions included counselling programs (n=7). The review explored short and long-term effectiveness of the interventions and concluded stage-based activity promotion programmes are generally more effective in promoting adoption of physical activity in the short-term (e.g., less than 6 months). However, the evidence on long-term adherence (e.g., greater than 6 months) is limited.

A further systematic review undertaken by Riemsma et al. (2002) of the effectiveness of stage-based interventions in all areas of behaviour change covered 37 RCTs. Unlike Adams and White's (2003) findings, Riemsma et al. (2002) concluded that little evidence was found that stage-based interventions are more effective than non-stage-based interventions. Similarly, minimal evidence was identified that stage-based interventions are more effective when compared to no intervention or usual-care.

Likewise, a systematic review by Bridle et al. (2005) including 37 RCTs targeting seven health related behaviours, concluded that there is limited evidence that stage-based

interventions are more effective in changing behaviour when compared with either non-stage-based interventions or even with no intervention or usual-care. Furthermore, there was minimal evidence that stage-based interventions were more effective at promoting stage progression. Of the 18 comparisons made, only six reported significantly more forward stage movement for the staged-based intervention, whilst seven comparisons found no difference, three of which were compared with usual-care or with no intervention controls. Bridle et al. (2005) offered some suggestions for why only a limit effect was found, including a lack of model specification contributing to inappropriately designed interventions and poor application. Other barriers to implementation were also noted including the accuracy of measuring stage of change, which is particularly important as effective stage-based intervention is necessarily dependent upon accurate stage assessment. An intervention based on misclassification may not deliver the right message to the right person. Despite the apparent lack of evidence, the authors highlighted that stage-based models do have a potential to enhance health behaviour, but there is a need for high quality, theoretically driven consistent intervention studies.

van Sluijs, Poppel, and van Mechelen (2004) conducted a systematic review of 29 trials that explored the effect of staged-based interventions on multiple behaviours including smoking, physical activity and diet. There was no conclusive evidence found as to the effect on physical activity; however, there was strong evidence for an effect at short and long-term follow-up for dietary behaviours. A limitation was the variation in application of the theory. Some of the studies reviewed were exclusively based on the TTM, while others applied only aspects. This heterogeneity makes it difficult to draw strong conclusions.

Inconclusive findings related to stage-based interventions were also found in Hutchison et al.'s (2009) systematic review related to physical activity interventions. Thirty-four studies were identified, with the most common interventions consisting of stage-based written information (66%) and counselling based on the TTM (71%). Short-term (less than six months) improvements were evident in 18 of the 24 studies (75%) reporting a significant effect for stage-based interventions over control conditions in terms of stage progression, activity levels, or both. Long-term results (greater than six months) were only obtained in eight (33%) of the 24 interventions and only two (8%) conducted follow-up assessments past 12 months. The findings suggested that the majority of studies failed to accurately incorporate all dimensions of the model and, as a result there were many inconsistencies noted in the development and implementation of stage-based interventions.

A systematic review by Bélanger-Gravel, Amireault, Godin, Vézina-Im, and Poirier (2011) on the long-term effectiveness of theory based interventions for overweight or obese

adults found that of the 23 reviewed studies, the Behavioural Model and Social Learning/Cognitive Theory were the most commonly applied models (83%), with only four studies that used the TTM. Although others have suggested that applying theory to interventions increases the likelihood of improving the effectiveness (Michie & Abraham, 2004; Wong et al., 2012), this was only weakly supported by this systematic review, and by others including Adams and White (2003), Bridle et al. (2005) and Riemsma et al. (2002).

2.3.2.4 Effectiveness of Self-Management Interventions to Address Obesity

Traditionally, self-management approaches have been applied to individuals who have chronic disease or conditions such as diabetes, CVD or mental illness. Recent government initiatives and policy have encouraged the implementation of different chronic disease self-management models into health, and the wider community service context in Australia. Extensive, high quality research has been conducted to explore the effectiveness of self-management techniques and models. Generally, participants have showed improvements in self-management practices, but those receiving flexible and tailored support and telephone coaching reported the greatest benefits (Francis, 2007). In more recent times, the techniques of self-management have been realised for those who are at risk but do not have evidence of disease, particularly for those with obesity. The adoption of self-management skills is key to the management of obesity and is an important goal of behavioural therapies addressing this issue (NHMRC, 2013a). However, self-management approaches for obesity remain largely untested and literature evaluating self-management for obesity is limited (NHMRC, 2013b).

A systematic review prepared for the NHMRC (2013b), of 137 articles highlighted the importance of self-management strategies for the management of obesity. It was concluded that interventions that include self-management support increase weight loss in the short-term and that self-efficacy, motivation and readiness to change need to be enhanced to improve the usefulness of self-management. It was noted that there are challenges associated with implementation of self-management of obesity and that there is currently a lack of attention to this in the literature.

Galdas et al. (2014) systematic review and meta-analysis explored the acceptability and accessibility of self-management support intervention for men with chronic conditions. Of the 38 interventions review they identified four constructs that are associated with men's perception of self-management including: need for purpose; trusted environments; value of peers; and becoming an expert. In support of the literature related to men's perception of health and barriers to healthy lifestyle adoption, Galdas et al. (2014) concluded that men may

find self-management interventions more appealing when they are action-oriented, having clear and practical strategies that can be easily adopted. The findings of this review offer important guidance for successfully engaging men in health interventions.

A systematic review by Bosch-Capblanch, Abba, Prictor and Gore (2007) covered 30 trials (only three focused on weight control) to assess the impact of contracts, as part of a self-management approach, between health care professional, patients and/or their carers, on patient adherence. Contracts included verbal or written statements agreeing to treatment and committing to adherence of it. They found that they increased weight loss compared with no contract in one study, which had a paediatric sample, but not the other two studies in adult populations. The authors concluded that although the evidence was limited, contracts could potentially contribute to improving adherence to preventive health regimens.

A recent systematic review by Small et al. (2013) examined self-management support from lay-health workers for people with vascular disease. The review of 10 primarily community based RCTs found that peer telephone support was associated with small, but significant improvements in self-management behaviour. There was limited evidence of impact on other outcomes, such as quality of life, health utilisation and cost-effectiveness.

Another systematic review assessed the effectiveness of lay-led self-management programs of people with chronic conditions (Foster et al., 2009). Of 17 trials of self-management programs, they found small, short-term improvements in participants self-efficacy, self-rated health, cognitive symptom management, and frequency of aerobic exercise. However, no studies were included Foster et al.'s (2009) review that focused on the use of self-management in obesity. However, a number of RCTs have been conducted that have focused on applying self-management approaches to managing obesity related conditions.

In rural South Australia, Pettman et al. (2008) conducted an RCT that assessed a group-based lifestyle program, adapted from the Stanford chronic disease self-management program, involving 153 overweight or obese adults with metabolic syndrome. Program self-management features included goal setting/ action planning and peer support groups. They found that the self-management techniques were perceived as helpful, particularly problem solving skills and goal setting. Improvements were noted in waist circumference (-3 cm) and body fat mass (-4%) after the four months of sessions. The use of group and 'peer' leaders were found to be supportive. Although the follow-up was short-term, recommendations were made for facilitation of peers being introduced into community-based models.

Another peer-led RCT conducted by Parikh et al. (2010) aimed to promote weight loss in 99 adults (mean age 48 years with a BMI > 25 kg/m²). The majority were predominately

Spanish speaking, low income women. However, the lay-led self-management lifestyle intervention focused on lay leaders providing simple, actionable messages that emphasised enhancing self-efficacy to make lifestyle changes. The intervention was provided over 10 weeks in eight 1.5 hour groups. Compared with the control group, participants in the intervention group lost more weight at 12 months (3.3 kg versus 1.1 kg, $p < 0.01$). This RCT further supported the use of peer-led interventions for weight loss.

An RCT conducted by Keranen et al. (2009) focused on a weight loss intervention that applied counselling based on self-management principles for 82 adults with a BMI > 27 kg/m². The intervention tested intensive versus short-term weight loss counselling with an 18 month follow-up. At six months, the mean weight loss in the intervention versus control group was 5 kilograms (± 5.7) versus 2.4 kilograms (± 2.5). At 18 months, the non-significant mean weight losses in both groups were 2.6 kilograms (± 6.0) and 0.7 kilograms (± 3.5) respectively. The study concluded that a significant change in eating behaviour was observed in both counselling groups, which suggests that short-term counselling based on self-management principles is also able to improve eating behaviour to a certain degree.

2.4 Summary of the Literature Review

The literature confirms that men's health is a major concern in Australia and in rural areas the issues are magnified. There has been increased recognition of the gender health disparity in the last two decades and an extensive amount of research and literature now exists. Despite this, it is evident that many of the studies are of relatively low quality, and typically small and qualitative in nature. Of this work, it is clear that recognised 'masculine traits' exist among rural men in Australia, which impacts on health beliefs and health behaviour, contributing to the reluctance of many men to seek help related to health issues (O'Kane et al, 2008b; Smith et al., 2008a). The literature has primarily focused on negative aspects of men and health, yet some research suggests that men are interested in health and want to engage in preventative care (Kolmet et al., 2006; Smith et al., 2008a). Barriers that impact on men's health service usage and adoption of healthy lifestyles have been detailed and opportunities to overcome these challenges highlighted.

There have been numerous health interventions that have focused on promoting healthy behaviours and encouraging healthy weight to reduce risk factors for chronic disease. The workplace has clearly been recognised as a suitable place to deliver health promotion and the numbers of international studies in this area are extensive. Interventions have generally targeted weight loss by means of improving physical activity and/or dietary intake. This review has identified that physical activity is more often the focus of interventions than solely

nutrition. The evidence suggests that multicomponent interventions are more effective than individual ones. Despite the challenges of evaluating multicomponent interventions, the literature suggests that future interventions aimed at preventing obesity, must focus on both physical activity and nutrition. Intervention components needed to include a combination of approaches such as goal setting, problem-solving, and self-monitoring, many key to self-management models. Lay Health Advisors, or Champions, have been identified as an important strategy for health promotion and chronic disease self-management; however, there is a lack of studies targeting rural men. Interventions based on theory and applied self-management techniques demonstrated greater effectiveness. Of the literature reviewed, there was considerable variability in the type of intervention, outcome measures, duration and follow-up. Overall, many studies had weak designs, small samples, and outcomes were often reliant on self-report measures. Many of the workplace interventions focused on predominately white-collar occupations and there was an apparent lack of studies addressing male blue-collar workers. The evidence suggests that workplace health promotion has the ability to produce positive health outcomes; however, due to the heterogeneity of the settings and populations the study effect sizes were often small.

Despite the extensive amount of literature in this area, there remains a paucity that specifically examines the effectiveness of multiphase interventions, particularly in men working in blue-collar industries in rural Australia. The majority of studies measured the short-term impact (generally less than six months), which failed to demonstrate the long-term or sustainable impact of the interventions (Anderson et al., 2009; Verweij et al., 2011). A further problem related to measuring interventions in the short-term is the potential to produce inaccurate or overestimated effects, particularly as weight regain may occur between six to 12 months and therefore, assessing weight outcomes requires longer-term follow-up (Müller-Riemenschneider et al., 2008).

The gaps identified in this review underscore the necessity for research in the area of workplace health promotion that applies self-management techniques designed for rural men working in blue-collar industries. Therefore, this mixed method study using a time series design assessed the feasibility and effectiveness of undertaking a workplace intervention based on the stage of change model that applied self-management techniques. It also aimed to explore the attributes, barriers and motivators that influence men's health-related practices and stages of behavioural change towards achieving a healthier lifestyle, as per the identified gaps in the literature. The following chapter details the methodology of this multiphase project that was designed to address the identified gaps, contribute to health knowledge and provide direction for future health care planning and delivery.

Chapter Three

Research Methodology

3.1 Introduction

This chapter details the methodology applied to the present study which examined whether *The 'Waist' Disposal Model* of self-management adapted from Aoun, Osseiran-Moisson et al. (2009) could be implemented successfully to industry worksites in regional WA. A mixed methodology will be justified and pertinent points of this approach described. Details of the methodology including sampling, participant demographics, data collection and analysis are presented. Measures to enhance the rigour of the research process are discussed and ethical issues related to the research and research processes are considered.

3.2 Research Design

Quantitative and qualitative paradigms imply different approaches to health research. Typically they are characterised as dichotomous perspectives which are opposite in their epistemological and methodological focus (Creswell & Plano Clark, 2011). A mixed methodology was selected as an appropriate design to meet the objectives of this study and this approach is known to enhance the validity of a study (Thomas, 2003).

A quasi-experimental, time series design was applied for the quantitative component of this study. The strength of this design is that it is a practical methodology that enables some research control to be attained when full experimental rigour is not possible (Polit & Beck, 2014). Time-series designs are one of the most commonly used quasi-experimental methods applied by health researchers (Polit & Beck, 2014). They are characterised by neither a control group nor randomisation, and data are collected over an extended period of time during which the intervention is introduced and monitored (Polit & Beck, 2014). There are several weaknesses in this design, including the threat to internal validity due to any extended timeframe collecting data, and the difficulty with making causal inferences. Despite these weaknesses, the design is practical, feasible and generalisable (Newell & Burnard, 2011), and it is appropriate for evaluating the effectiveness of a lifestyle intervention when randomisation and strict control would not be possible.

A descriptive exploratory design was selected as an inductive research method for the qualitative component of this study (Sandelowski, 2000; Sandelowski, 2010). This was a useful qualitative approach as it was broad ranging, purposive and designed to maximise discovery in the chosen area (Stebbins, 2001) by providing descriptions of phenomena, which was highly desirable in this study. This qualitative method permitted a broader understanding and deeper insight into the stages of change, which, although a well-researched topic, was yet to be explored in detail in a population of men in a rural workplace who were at risk of developing chronic disease.

Although self-management programs have been widely implemented across various industries and sectors of society previously, their impact on populations at risk of chronic disease in rural areas has, until now, been inadequately explored. The mixed method approach used in this study has facilitated not only the evaluation of a multiphase intervention, but an in-depth exploration of the experiences of the participants involved.

3.3 Operational Definitions

For the purpose of this study the following definitions of key concepts have been applied:

Forestry Workforce- includes all business and organisations whose primary activities are growing, managing or processing trees for wood and paper production.

Blue and white-collar workforce- The terms "blue-collar" and "white-collar" are occupational classifications that distinguish workers who perform manual labour from workers who perform more professional, office jobs. For this study, blue-collar workers are those who operate forestry machinery, such as loggers, chippers, skidders and trucks, as well as those who maintain machinery and other manual forestry work. White-collar workers are forestry managers, research officers and administrators.

Body Mass Index (BMI)- is a measure of body fat mass, calculated by dividing a subject's weight by the square of his/her height, expressed in metric units. BMI is classified as follows:

- Less than 18.5 kg/m² - underweight
- 18.5-24.9 kg/m² - normal weight
- 25-29.9 kg/m² - overweight
- 30-34.9 kg/m²- class I obesity

- 35.0-39.9 kg/m² - class II obesity
40 kg/m² or over - class III obesity (WHO, 2000).

Obesity- is a condition in which excess body fat has accumulated to such an extent that health may be negatively affected. It is commonly defined as a BMI of 30 kg/m² or higher. This is distinguished from being overweight as defined by a BMI of between 25–29.9 kg/m² (WHO, 2000).

Champions- also referred to as lay health advisors or natural helpers in the literature, are volunteers who were selected to provide support to their peers. Champions were recognised as “insiders” to their own community, with an understanding of their needs and barriers. For the purpose of this project, Champions were forestry workers who have limited knowledge and experience with health care, but provide an effective means of reaching their fellow forestry workers. Their role was to assist with the delivery of the intervention, including recruiting participants, organising educational sessions, conducting monthly biophysical measurements, motivating participants, disseminating resources, and providing the main communication channel between the researcher and the participants.

Impact- is used to in the context of the study to describe the change in health risk factor profile over time.

Self-management- is defined in the National Chronic Disease Strategy (NHPAC, 2006, p.37) as “the active participation by people in their own health care”. Self-management programs are useful in primary and secondary care as they are designed to teach problem solving skills, which in turn allows individuals to identify their own problems and provides techniques to assist people to make decisions, take action for their own health, and facilitate adoption of healthy behaviours.

Motivational Interviewing (MI)- is defined as a client-centred method for enhancing intrinsic motivation to change by exploring and resolving ambivalence (Miller & Rollnick, 2002). There are four guiding principles of MI: (1) Express empathy with reflective listening; (2) Develop discrepancies between current behaviour and goals; (3) Work with resistance and channel it rather than confront it; and (4) Support self-efficacy (Britt, Hudson, & Blampied, 2004; van Wormer & Boucher, 2004).

The Transtheoretical Model- is also known by the abbreviation TTM and by the term Stages of Change Model. It assesses an individual's readiness to act on a new healthier behaviour, and provides strategies, or processes of change, to guide the individual through the stages of change (Prochaska & Velicer, 1997). The model consists of four core constructs:

stages of change, processes of change, decisional balance, and self-efficacy (Glanz, Rimer, & Viswanarth, 2008).

Stages of Change- Developed from the TTM, stage of change refers to the cyclical process that involves a series of stages necessary to achieve behaviour change. There are various models, but for the purpose of this project the five stages of change model has been applied, as indicated above, namely (Prochaska & Velicer, 1997):

1. Pre-contemplation (no intention to change)
2. Contemplation (considering a change)
3. Preparation (committing to change)
4. Action (making changes)
5. Maintenance (sustaining changes).

Self-Efficacy- is not a measure of skill but is the belief or the confidence individuals have in their ability to accomplish behavioural change (Masse, Heesch, Eason, & Wilson, 2006). Given its association with changes in behaviour, it has been integrated into several behaviour change models including the TTM and has been used in this study as a measure of predicting change in nutritional and physical activity.

3.4 Theoretical Orientation for the Study

This mixed method study aimed to determine whether a self-management model could be effectively implemented to an at-risk population of men working in forestry related industry in rural WA. A health psychology model, the TTM (Prochaska, & Velicer, 1997), provided a foundation for guiding this study. The TTM consists of the notion that behavioural change involves movement through a series of discrete stages, which appear to be common to most behaviour change processes (Behaviour Works Australia [BWA], 2012; Nutbeam & Harris, 2004; Zimmerman, Olsen, & Bowsorth, 2000). It is based on the premise that behaviour change is a process, not an event, and that individuals have varying levels of motivation, or readiness (Prochaska & Norcross, 2003) move through the stages of change in the adoption of healthy behaviours or the cessation of unhealthy ones. There are five basic stages of change as highlighted in Figure 3.3. Some TTMs include a sixth stage, termination; however the five stage TTM has been selected to guide this study because in areas such as exercise and weight control the desired goal is a lifetime of the maintenance stage (Prochaska & Velicer, 1997). Research has shown that movement through the stages occurs in a cyclical manner (Figure 3.1), with multiple entry points. People often making several attempts (relapses) before reaching maintenance. Moreover, they may not remain in the maintenance stage for long

before they regress and need to repeat the process (Prochaska, Di Clemente, & Norcross, 1992).

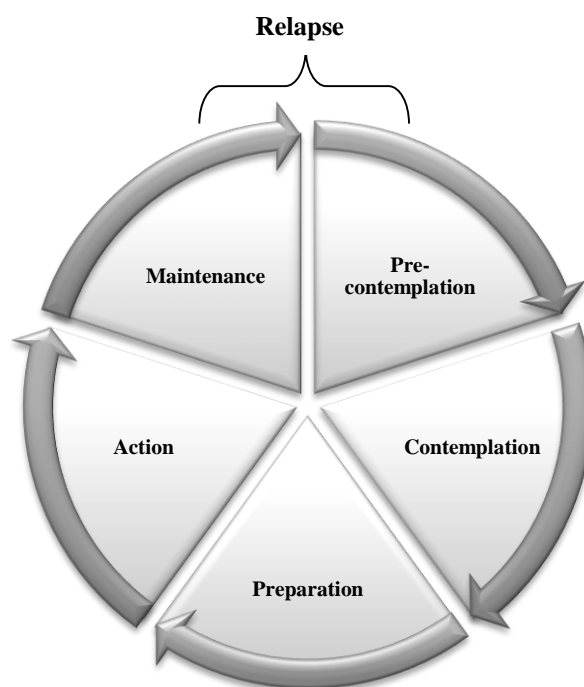


Figure 3.1. The Transtheoretical (Stages of Change) Model

Adapted from Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In search of how people change: Applications to addictive behaviors. *American Psychology*, 47, 1102-1114.

The *stages of change* concept is the first component of the TTM, and is important in explaining its conceptual framework. The second component is the *processes of change*, which explains how the shifts in the stages occur and what activities individuals use to move through the stages. Certain predictors of progression through the stages have been identified and are purportedly more sensitive to capturing progress within the stages than other outcome measures such as actual change in behaviour. These immediate outcome measures include decisional balance, temptation and self-efficacy (Prochaska & Velicer, 1997). Decisional balance refers to the weighting of pros and cons to changing behaviour; it is postulated that in the earlier stages of change the cons of changing are expected to outweigh the pros, while in the later stages the pros are expected to outweigh the cons. Temptation refers to the intensity of engagement in a particular behaviour. It is hypothesised that the temptation to engage in undesirable behaviours is higher in the earlier stages and lower in the later stages (BWA, 2012; Prochaska & Velicer, 1997). Self-efficacy refers to an individual's confidence in his/her ability to take action and persist in this action (Prochaska & Velicer, 1997). This is a central concept in the TTM as it influences choice, effort, thoughts, and emotional and behavioural performance (Marcus & Simkin, 1994). Measures of self-efficacy have been identified as key

determinants of progression through the stages of change, and have been widely used in measurements of physical activity and nutrition (Sallis Pinski, Grossman, Patterson, & Nader, 1988).

The TTM is a common model applied in health psychology and has proven useful in studying a variety of health behaviours, including: smoking cessation, weight control, sunscreen use, reduction of dietary fat and exercise acquisition (Logu et al., 2004; Prochaska & Norcross, 2003). The TTM, as the process for change, has been instrumental in framing intervention development, and is used as a guide for engaging participants to proceed through the stages. It implies that interventions need to be matched to the individual's specific stage of change by targeting the processes that influence these transitions, rather than traditional, generic, action-orientated intervention (Glanz et al., 2008).

Despite the widespread advocacy of the TTM, there have been a number of criticisms of the model, including its focus on conscious decision making and failure to acknowledge that change can occur with little planning or preparation (BWA, 2012; De Nooijer, van Assema, De Vet, & Brug, 2005). The model has also been criticised for focusing on transitions, rather than the actual behavioural outcome. Furthermore, despite the large volume of literature relating to stage-matched interventions, there is limited evidence suggesting that they are more effective than non-stage matched interventions in changing health related behaviours (Adams & White, 2005; BWA, 2012; Bridle et al., 2005; Riemsma et al., 2003; SIGN, 2010; van Sluijs et al., 2004). The apparent weaknesses of the TTM generally relate to how researchers operationalise the stages of change and design interventions (Glanz et al., 2008).

Nevertheless, the majority of the literature suggests that the TTM can be a valuable tool, and adds weight to the assertion that behavioural change requires more than a "one size fits all" approach to intervention. The multiphase *'Waist' Disposal* intervention was designed with this in mind and was specifically established to move participants through the stages of change and support them at each stage. The research reported in this thesis also aimed to explore the best way to promote progression through these stages by examining the success of each part of *The 'Waist' Disposal Model* at moving participants along the change continuum. It was hoped that gaining this understanding would inform future health initiatives that target men in rural areas.

3.5 The Industry ‘Waist’ Disposal: A Multiphase Self-Management Intervention

Research has demonstrated that health disparities reflect a complex interplay of factors that operate on many different levels, often beyond individual level characteristics and resources (Holmes et al., 2008). There is little doubt that the change in healthy behaviour is a process and people are at different stages in terms of their readiness to change their lifestyles (BWA, 2012; Glanz & Rimer, 1995). Traditionally, health care providers have focused on action-oriented interventions: education, skills acquisition and problem solving. These work well for those in a motivational state of readiness to change (Vallis et al., 2003). However, those who are not already motivated to change require more individualised strategies. Therefore, a “one size fits all” approach to health prevention should be avoided, and interventions that are responsive to the dimensions of change (BWA, 2012) are required to modify lifestyle behaviours so as to change health outcomes.

Lifestyle interventions offered at multiple levels, and tailored to the community context, are the most efficient way to initiate and sustain behaviour change (Glanz et al., 2008; Kirk, et al., 2012; NHMRC, 2013a). National and international guidelines for addressing obesity recommend that interventions be multicomponent: addressing diet, activity modification and goal setting (NHMRC, 2013a; NICE, 2006; SIGN, 2010). The advantages and emphasis on the need for multiphase interventions are well documented (Glanz & Rimer, 1995; NICE, 2006; SIGN, 2010), however, they can be challenging to design, conduct and/or replicate. A major limitation is the difficulty in evaluating their effectiveness (Glanz & Rimer, 1995; Patton 2002) as they often include many components and produce various small effects (Michie et al., 2009). Weitzman, Mijanovich, and Silver (2009) suggests that multiphase interventions require evaluation designs that are equally complex and consider the community, and should be continually re-evaluated and improved upon from by assessing what works and what doesn't.

The multiphase intervention used was tailored to meet the individual needs of participants depending on their readiness for change, in accordance with the five different stages of changes that appear to be common in most behaviour change processes (Nutbeam & Harris, 2004; Zimmerman et al., 2000) as described earlier. It took into consideration the key recommendations related to lifestyle changes and self-management strategies specified in the national and international guidelines (NICE, 2006; NHMRC, 2013a; SIGN, 2010). Consideration was also given to its design in enabling specific evaluation at each phase.

Forestry organisations were involved in the planning phase to ensure that the intervention was appropriate and amenable to the forestry workforce. As illustrated in Figure 3.2, it was delivered over three phases, each designed to move participants through the stages of behaviour change. Figure 3.3 depicts the three phases of the intervention over time and the data collection points. The intervention was planned to be delivered over 15 months (three months for phase one and 12 months for the second and third phases). Data were collected at multiple time points to facilitate evaluation at each phase.

Volunteers from each organisation (Champions) self-nominated and agreed to lead the program within their organisation. These Champions were forestry workers without formal health care training or qualifications, and were supported by the researcher to provide information and motivate their peers. They received basic training about the project, accurate measuring techniques and were supported by the researcher, who also managed and monitored for quality of the data they collected. The following section will discuss the phases of the project, which will be followed by details on the sample and setting and data collection. For the purpose of this study, the primary directional hypothesis was that *The 'Waist' Disposal Model* of self-management would be successful in progressing and sustaining men through the different stages of behaviour change. The details of the three key phases of this multiphase self-management study and their associated hypotheses are presented.

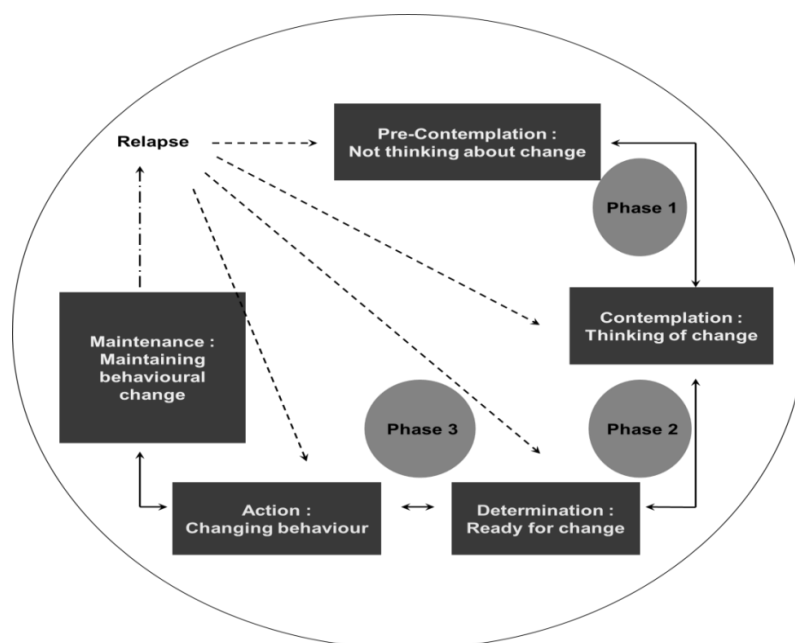


Figure 3.2. The multiphase intervention embedded in the cycle of the Transtheoretical Model

Source: Aoun, S., Osseiran-Moisson, R., Collins, F., Newton, R., & Newton, M. (2009). A self-management concept for men at the community level: The 'waist' disposal challenge. *Journal of Health Psychology, 14*(5), 663-674, p.664.

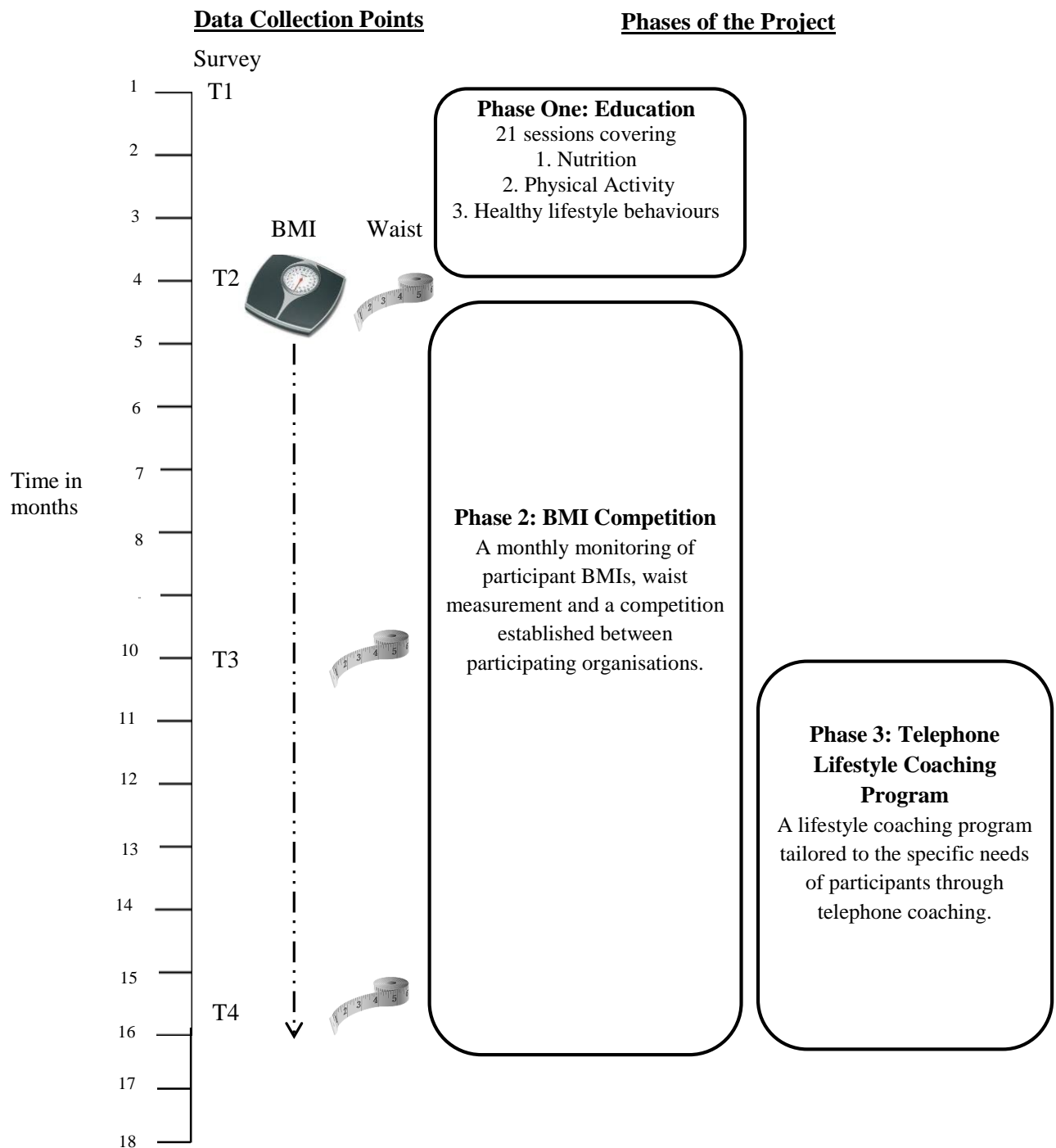


Figure 3.3. Diagrammatic representation of the project

3.5.1 Phase One: Education

Education is necessary to create awareness of healthy versus unhealthy behaviours and promote understanding of healthy weight; however research has shown that education as a sole intervention is not typically associated with significant weight reductions (Belalcazar, Reboussin, & Haffner, 2010; NHMRC, 2013a; Schmitz et al., 2007; Silva et al., 2010). Education was used as the first phase of this intervention to create awareness and improve knowledge of healthy lifestyles, which was reinforced by later phases. There were three sessions in this phase, namely:

1. introduction to the project and healthy lifestyle habits
2. nutritional advice
3. physical activity information.

Participants were recruited by advertising flyers (Appendix A) and personal invitations from Champions. They were given information sheets and provided written informed consent (Appendix B) prior to participation. Participants were given the opportunity to ask questions of the researcher before commencing the program. Further details about recruitment and consent are discussed in the section describing the sample.

The educational material and the logo were sourced from *The Rotary 'Waist' Disposal Challenge* project, as discussed in Chapter One (Section- 1.2.5.1 *The 'Waist' Disposal Model of Self-Management*), and was purposely developed to appeal to a community audience (Aoun et al., 2013b). The adaption of the educational material was based on a review of the literature, the views of experts in the field and the project supervisors. The material was established on adult learning principles and applied diverse learning strategies, including visual presentation, practical skills and humour (Aoun, Collins, Newton, Heron, Mc Faull, & Le, 2009; Aoun et al., 2012). Table 3.1 details how the original *The Rotary 'Waist' Disposal Challenge project* was adapted for this project. The educational material was initially developed as PowerPoint presentations that were then printed onto flip charts (Appendix C). This allowed flexibility in the delivery and accommodated for the diverse range of settings where the education was provided. Additional resources were used during the sessions to make them practical and create engagement, for example: fat models, sugar models, artery models demonstrating atherosclerosis and food labels were used during the nutrition and healthy lifestyle sessions. Examples of basic exercises were conducted during the exercise sessions to demonstrate ways the forestry workers could incorporate activity into their lives.

The researcher facilitated each of the sessions and a baseline Lifestyle Survey (T1) was conducted prior to delivering the first introductory presentation (Appendix D). Although it was initially planned that the sessions would be delivered once a month for three months, the education took between three and six months to deliver due to other commitments of the participating organisations.

Table 3.1. Changes made from the original project

Rotary ‘Waist’ Disposal Project	Industry ‘Waist’ Disposal Project
Theoretical underpinnings	Retained for project
Phase One: Education	Modified education material to meet specific population needs. Adapted style and delivery mode e.g.: powerpoint presentations changed to flip charts
Phase Two: BMI competition	Utilised concept. Modified delivery to suit workplace. Regular support visit by researcher. Resources new to suit target population.
Phase Three: Lifestyle Coaching	Utilised concept. Modified coaching contract to suit population and data collection focus. Adapted data collection tool specific for project.

The presentations were conducted in the workplace during work hours to encourage participation. Initially all overweight men were encouraged to attend, however, it was evident that men with healthy weight and females workers could not be excluded. Organisations allocated specific times for the presentations to meet their needs and to optimise attendance rates, they also provided incentives such as morning tea, lunch, or after-work barbeques to encourage workers to attend. The location of the presentations varied from meeting rooms, sheds, and the field next to machinery, for the convenience of participants. Length of the sessions varied from 25 minutes to one hour and was dependent on the number of participants and level of engagement. The first presentation was delivered by the researcher; the nutrition and exercise presentations were then delivered by a nutritionist and exercise physiologist respectively. All presenters were local health professionals involved in the local health system and hence could demonstrate credibility to participants.

Several key strategies were used to increase participation in this phase, including direct contact between educators and participants; encouraging camaraderie between peers including recruitment by colleagues (Champions) in order to maximize participation; and delivery of the program within the workplace and during work hours. Although the majority of participating organisations worked on a Productivity Financial Bonus system, they were willing to operate

as a team and participate together. The rationale for phase one was that education needed to be delivered to create awareness and to assist participants in progressing from pre-contemplation to contemplation in their motivation for change.

Phase One Hypothesis

By delivering phase one of the intervention (education presentations), most participants would progress from the pre-contemplation stage to the contemplation stage of change; that is, they would be actively contemplating lifestyle change.

Participants who attended the education sessions and met the inclusion criteria (as described in the section- 3.6.2 Sample) were invited to participate in phase two of the study.

3.5.2 Phase Two: Body Mass Index Competition

The education phase was followed by phase two of the intervention, which consisted of a program monitoring BMIs. Research has indicated that active interventions may be more effective than those that are passive (Albarracin et al., 2005; Michie et al., 2009). The duration of the intervention and frequency of review of weight loss appears to influence the success of weight loss interventions (Hemmingsson, Udden, Neovius, Ekelund, & Rössner, 2009; Keranen et al. 2009; Littman et al. 2007; NHMRC, 2013a; Shaw et al., 2006), therefore this phase involved a monthly review of weight loss progress. It was established as a competition between participating organisations; competition is reportedly an effective health motivator for men (Aoun & Johnson, 2002a, 2002b; Commonwealth of Australia, 2010d; NPHP, 2003). Champions were responsible for measuring the BMI of participants from their organisations and keeping monthly records of all measurements, maintaining motivation and disseminating information to their peers.

Those who had participated in the education sessions were invited to participate in the BMI competition. They were given information sheets and provided written informed consent (Appendix B) prior to participation. Organisations were supplied with identical digital scales (kindly supplied by the Rotary 'Waist' Disposal Project Team), measuring devices, BMI charts, BMI competition database (Appendix E) and measuring protocols (Appendix F). A measurement database for each organisation was established, so that Champions could enter the data and send it through to the researcher. The Champions were supported regularly by telephone and face-to-face visits from the researcher.

It was expected that this phase of the project would last 12 months, however, most organisations wished to continue measuring beyond this period. The researcher attended, on average, four weigh-in sessions for each organisation throughout the 12 months to promote interest and encourage both Champions and participants. Each month Champions were provided with their organisation's BMI progress, which was charted individually and against other participating forestry organisations. This allowed them to track their weight loss efforts and compare with others involved in the competition. Champions were also sent health promotion materials and low-level strategy resources by the researcher, such as, suggestions for exercise and meal plans by way of emails, pamphlets and posters (Appendix G) disseminated to participants. It was acknowledged that many of the participants did not have ready access to emails, so written materials were generally provided in hard copy. Pedometers were also provided to all participants in the BMI competition (partially courtesy of *The Rotary 'Waist' Disposal Challenge* project), as they have been associated with significant increases in physical activity levels (Bravata et al., 2007). These resources were designed to encourage continued interest, prompt adoption of healthy eating and the undertaking of exercise, by applying different health promotion strategies.

The Lifestyle Survey (T2) was collected at commencement of the BMI Competition and again at six (T3) and 12 months (T4) after commencement of this phase. The rationale for phase two was to motivate participants to progress from the contemplation to preparation stage of change.

Phase Two Hypothesis

By delivering phase two of the intervention (the BMI Competition), most participants would progress from the contemplation to the preparation stage of change.

At six months into phase two, participants from each organisation were offered the opportunity to participate in phase three of the project: The LCP. Phases two and three overlapped, and participants who were in phase three were also involved in phase two (refer to Figure 3.3 for illustration of the project and data collection).

3.5.3 Phase Three: Lifestyle Coaching Program (LCP)

Changing lifestyle factors such as diet and exercise is often difficult and requires much effort and motivation (Britt et al., 2004). Lifestyle coaching is widely supported in the literature as a means by which lifestyle coaches apply evidence based psychological counselling and coaching techniques in order to motivate individuals to achieve positive health and lifestyle outcomes (Health Coaching Australia, 2008). The third phase of the project consisted of a LCP, and, in particular, a lifestyle risk modification program tailored to the needs of participants. Participation and progress was monitored at regular intervals through routine follow-ups by a lifestyle coach. Lifestyle coaching targeted weight loss, mainly through the encouragement of healthier nutrition and increased physical activity. Weight loss was chosen as the goal because it was hypothesised that men would be more willing to do something about their weight, as it was more visible than other less obvious risk factors, such as hypertension or high cholesterol (Egger, 2000). The LCP was devised to meet the needs of the setting and sample. Lifestyle coaching can be delivered face-to-face, by telephone or by email (Health Coaching Australia, 2008; Lorig et al., 2006). Support delivered via the telephone has been used as an effective way to fill gaps in health services and allow on-going follow-up. It is of particular relevance in rural areas where access to health professionals is limited (Piette, 2005), and was selected as the mode of delivery for this phase.

The lifestyle coach was a locally based female professional who was experienced in lifestyle coaching, had her own lifestyle coaching business and was involved previously in *The Rotary 'Waist' Disposal Challenge* project that was discussed in Chapter One. A coaching protocol (Appendix H) was used as a guide; based on the best practice guidelines for the treatment of excess weight and obesity in adults (specifically, the 10 step summary of the clinical management guidelines) (Dietitians Association of Australia, 2008). This protocol was developed with input from the coach, taking into consideration the sample and setting. The coach adopted the MI technique which has demonstrated effectiveness in assisting individuals with lifestyle change (Miller & Rollnick, 2002). This was achieved by following the guiding principles of MI (van Wormer & Boucher, 2004). The core of the coaching sessions was expressed in a coaching contract that was agreed to by participants and coaches (Appendix I). The contract was designed to provide increased ownership and commitment to self-management by focusing on strategies that could assist in reducing weight and achieving other health related goals. Goals were set around the SMART (specific, measurable, achievable, realistic and timely) tool and were dependent on individual situations and experience (NHMRC, 2013a). The written contract was designed to act as a reminder of a participant's goal(s). The contract was also used during analysis to compare the self-reported

stage of change on the Lifestyle Survey, to the coach's reported stage of change. Up to four sessions were offered to participants, this being based on previous experience with *The Rotary 'Waist' Disposal Challenge* project and the literature relating to telephone lifestyle coaching (Aoun et al., 2012).

Participants who were deemed eligible to participate in the LCP were identified by the researcher from the monthly BMI data. Champions and the researcher then directly approached a participant to offer the opportunity to partake in the LCP. Interested participants were provided with an information letter detailing this phase of the project, given the opportunity to ask questions and invited to complete a declaration of informed consent prior to involvement. Invited participants who consented then provided the Champion with preferred contact details and available times to call, the Champion then passed this information on to the researcher who collated a list for each organisation. This in turn was given to the lifestyle coach, who was responsible for contacting the participant and setting up an appointment to commence coaching. The coach maintained rapport with the participants throughout the duration of the program. A copy of the completed T3 Lifestyle Survey was provided to the coach, who then made contact to organise a time for the coaching session. The T3 survey formed the basis for discussion and assisted the development of rapport between the participant and coach.

Phase Three Hypothesis

By delivering phase three of the intervention (the LCP), most participants would progress from the preparation to the action stage of change.

3.6 Setting and Sample

3.6.1 Setting

Recruitment occurred in the Great Southern region of WA through forestry industry organisations. This region offered an excellent opportunity to implement a self-management program based in a rural area, as it has a history of a strong forestry industry which traditionally employed large numbers of men. Prior to the project, discussions with forestry organisations in this region of WA indicated that they identified obesity and poor health of their employees as a major concern. They also conveyed their willingness to participate and be supportive of an intervention such as *The 'Waist' Disposal Program* for their forestry employees.

The Great Southern region covers an area of approximately 40,000 square kilometres and has a population of approximately 55,000 people living in a mix of regional, rural and remote areas (ABS, 2013d). The main industries in the region are agriculture, fishing, forestry, mining, tourism and viticulture (ABS, 2012b; WACHS, 2012).

Initially the project focused on forestry related organisations only, however during implementation the decision was made to expand the opportunity to other industries. A total of 17 organisations (n= 10 forestry) were approached to participate. Of these, nine verbally agreed, yet only six forestry organisations eventually consented and commenced involvement. Although one non-forestry organisation participated, it is not included as it is not comparable to the forestry sector. Of the 10 organisations that declined to participate in the program, the following reasons were given:

- financial instability of the organisation (two of the initial organisations approached went into receivership before the project had commenced)
- concerns about loss of productivity
- existing health programs for employees
- logistical issues and concerns (e.g., employees located in numerous locations)
- uncertainty of workforce (e.g., reliance on migrants and casual employees).

Primary work activities of the six small or medium enterprises based in the Great Southern region which participated in this project included management of plantation forests, hardwood tree harvesting, infield and processing chipping, and transport of woodchips and logs (Table 3.2). The mean number of employees in each organisation was 37.8 (range 9-80), the majority being males (90%). The median estimated reported income was \$69,200 with 65 percent of employees working between 40 and 50 hours per week. Employees in organisations that harvest trees and transport wood worked significantly longer hours than those in organisations that manage forests. All organisations reported having access to occupational health and safety, but few reported having access to health information prior to the project, other than those related directly to their work. The workforce attrition level varied, with two organisations offering all staff redundancy or re-employment during the project.

Table 3.2. Characteristics of participating organisations

Organisation	One	Two	Three	Four	Five	Six
Number of Employees	35	9	22	80	21	60
Hours Worked per Week	30-40	40	50-60	50-60	40-50	40-50
Average Income	\$93,000	\$60,000	\$55,000	\$62,400	\$65,000	\$80,000
Work Activity	Wood processing	Forest management	Tree harvesting and infield chipping	Transport	Forest management	Tree harvesting and infield chipping

3.6.2 Sample

3.6.2.1 Quantitative Data Collection

Sample size requirements for each phase were calculated using power analysis (Polit & Beck, 2014). A bio-statistician at Curtin University was consulted and, based on a paired t-test and comparing the results for the continuous outcome of BMI, it was determined that a minimum sample of 66 participants should have 80 percent power to detect an effect size of 0.35. This effect size was considered sufficient for a project of this nature. Previous experience with *The Rotary 'Waist' Disposal Challenge* project suggested that attrition rates would be relatively low from projects conducted in already established groups. An initial dropout rate of 20-30 percent was estimated, therefore requiring a sample of 83-94 participants in phase one. This project commenced in 2008, when the forestry industry was experiencing major growth in the Great Southern region and internal demands for wood chips were high. However, the Global Economic Crisis and worldwide natural disasters (such as the Japanese Tsunami) resulted in major downturns in the export demands for wood chips, forcing the collapse of a number of organisations. As a consequence, several major WA forestry organisations went into receivership: those remaining organisations slowed in their production. This created forestry job losses, which continue to have an impact on the industry today, and in turn contributed to a higher dropout rate.

Initially, a convenience sample approach was used in the recruitment of participants to test the effectiveness of the first two phases of the multiphase self-management intervention. The inclusion criteria were:

- living in the Great South region of WA
- employed in one of the selected forestry organisations

- working age (18-65 years)
- able to read and speak English, i.e., they did not need an interpreter.

The study initially aimed to recruit men working in forestry industries aged between 35 and 65 years. Literature suggested this age group is at risk of developing chronic disease due to poor lifestyle habits (COHFE, 2001; ForestWorks, Industry Skills Council, 2009). However, on commencing the study, it was judged appropriate to expand the inclusion criteria to those of working ages 18 to 65 years, as the younger workforce represented potential participants who met the criteria of risky lifestyles; this younger age group also wanted to participate. In addition, as this project focused on camaraderie and team work to achieve healthy lifestyle change, it would have been inappropriate and problematic to exclude individuals because of their age. Phase three of the intervention included a purposive sample from phase two participants with specific inclusion criteria, namely:

- a BMI ≥ 27
- availability for the duration of the intervention.

3.6.2.2 Qualitative Data Collection

The qualitative component of the project involved a purposive heterogeneous sample of men who varied with regard to their demographic profiles, stages of change and experience with the intervention (such as participation or non-participation at different phases) and success, or otherwise, related to the intervention. Selected participants were approached by the researcher and offered the opportunity to be involved in individual interviews once the intervention was complete. The sampling process for the interviews was guided by data collection and continued until data saturation was achieved.

3.7 Data Collection/ Instrumentation

The mixed methodology approach facilitated data collection in both quantitative and qualitative forms.

3.7.1 Quantitative Data Collection

Quantitative data included the administration of a Lifestyle Survey tool, biophysical measurements and a coaching contract.

3.7.1.1 The Lifestyle Survey

The Lifestyle Survey consisted of a questionnaire used to measure changes in health behaviours. This self-report questionnaire was adapted from *The Rotary 'Waist' Disposal Challenge* project (Aoun, Osseiran-Moisson et al., 2009) and incorporated several well validated instruments, which are discussed in detail below. The survey tool's development was based on findings from the literature, the knowledge and views of experts in the field and project supervisors. The original survey used for the Rotary Project comprised of 11 pages over seven sections, covering 42 questions. Alterations were made to reflect changes in the sample (such as a younger target group with fewer formal qualifications), the objectives of the project, and feedback from researchers working on *The Rotary 'Waist' Disposal Challenge* project. Redundant questions were removed and new questions were added. The subsequent survey tool had a reduced set of 28 questions when first piloted.

A pilot test of the tool was conducted to highlight any difficulties and inconsistencies, so that these could be corrected prior to administration (Polit & Beck, 2014). A convenience sample of 10 rural men working in forestry related industries completed the pilot questionnaire. An additional form was added, including five questions which sought information about duration of time to complete the survey, ease of completion, comprehensive, relevance, other questions to be included, and a request for additional comments or feedback. Feedback from participants in the initial pilot indicated that the duration for completion varied from 10-22 minutes. Those who completed in a shorter duration typically failed to answer some of the questions. Participants commented that the tool took too long to complete and there were too many questions. It was evident that some of the questions were ambiguous as some inconsistencies were noted in their responses. Formatting changes were made for ease of delivery and other changes were made based on the feedback received during the pilot. The modified tool consisting of 19 questions was re-piloted using a further 10 men from various backgrounds, with generally positive responses and a mean completion time of 10 minutes. An additional question related to marital status was added. Data from the piloted questionnaires were analysed to test the analysis plan.

The final Lifestyle Survey tool implemented for the project (Appendix D) consisted of 20 questions in four key sections, namely:

1. Demographic and Health Profile
2. Diet
3. Physical Activity
4. Motivation to Change Behaviour and Self-efficacy.

Stage of change questions were integrated into the diet and physical activity sections of the tool. The Lifestyle Survey was used as a self-report tool and was completed at four time intervals; pre-education/baseline (T1), post-education/pre-BMI competition (T2), mid-BMI competition/pre-LCP (T3) and post LCP (T4) (see Figure 3.3, which depicts data collection times).

Demographic and Health Profile (Questions 1-8)

The information collected in this section comprised of questions that were likely to influence health outcomes, namely age, occupation, marital status, and general health related questions such as medical conditions and medication intake. Additional lifestyle change measures, such as smoking and alcohol use, were also included.

Diet (Questions 9-11)

The nutrition and diet questions were sourced from a modified version of Wright and Scott's (2000) Fat and Fibre Barometer (FFB). The tool has a good reliability ($\alpha = 0.86$) and test-retest reliability ($r = 0.92$), and been used in a variety of populations and settings (Wright & Scott, 2000). The FFB was adapted with permission from the author and included a total of nine questions that focused on the frequency of intake. Each question had a categorical range of answers and was scored between one and five. FFB scores were summed to give an overall nutrition score ranging from nine to 45, with low scores indicating high fat and low fibre intake and high scores the reverse. Hence, the higher the score, the better the participant's nutritional intake.

A stage of change question related to weight loss and fat intake was included, with response categories reflecting the five stage model. A two week time frame was used because it was assumed that "this is about as far in the future as most people plan a specific behaviour change" (Prochaska et al., 1994, p. 40). This specific short time period was also consistent with the literature in terms of predicting behavioural intentions (Bagozzi & Warshaw, 1990; Donovan, Jones, Holman, & Corti, 1998).

Physical Activity (Questions 12-19)

Physical activity questions were sourced from the Active Australia Survey (AIHW, 2003b), which was designed to measure participation in physical activity one week preceding the intervention. The original tool included questions assessing participation in various types of physical activity, as well as five statements assessing awareness of public health messages. As these final five questions were not relevant to the evaluation of this intervention, they were excluded. The questions were developed and intended for use with individuals aged 18-75

years, which was appropriate for the target audience of the present project. The tool reportedly has excellent reliability, with intra-class correlation coefficients ranging from 0.71 to 0.86 and Spearman's Rho from 0.54 to 0.77 (AIHW, 2003b). It has been used nationally and within individual States and Territories. To avoid over-reporting errors, the AIHW (2003b) recommended that any times greater than 14 hours (840 minutes) spent doing a single activity are recoded to 14 hours. For the purpose of calculating "sufficiency" of activity for health, The National Physical Activity Guidelines for Australians (DoHA, 2010) recommend that individuals require at least 30 minutes of at least moderate intensity physical activity on most days of the week; this was interpreted as a total of at least 150 minutes (2.5 hours) of activity per week. Therefore the following categories are used:

- sedentary (no activity) = 0 hours
- insufficient (participating in some activity but not enough for a health benefit
= < 149 minutes (2.49 hours)
- sufficient = 150 minutes (2.5 hours) or more (AIHW, 2003b).

A stage of change question related to exercise was included to measure a participant's readiness to engage in physical activity.

Motivation to Change Behaviour and Self-efficacy (Question 20)

According to the NHMRC (2013a), when assessing readiness to change, it is also important to measure an individual's motivation and confidence in their ability to change. Motivation and self-efficacy were measured using the self-efficacy instrument by Sallis et al. (1988), which is related to diet and exercise behaviours. This has test-retest reliability for the exercise scale of 0.68 and for eating behaviour factors ranging from 0.43 to 0.64. Internal consistency, measured by alpha coefficients, ranged from 0.83 to 0.85 for exercise factors, and from 0.85 to 0.93 for eating factors. Contact with the lead author (Sallis) identified a shorter version of the original survey which has been used. A total of 16 questions (eight related to nutrition and eight related to physical activity) were included, all taken directly from the original instrument. Questions scored from one (I know I cannot) to five (I know I can) with six also an option ('it doesn't apply'), which was coded as a missing value (Sallis et al., 1988). Respondents received a total self-efficacy score ranging from 16 to 80, consisting of two subscales, one for nutrition and one for physical activity: both scored from eight to 40. Low scores indicated low levels of confidence in adhering to a healthy diet and exercise behaviours, while higher scores indicated higher levels of confidence.

3.7.1.2 Biophysical Measurements

Biophysical measurements included BMI and waist measurements and were collected at multiple time points throughout the intervention. Measurements (BMI and waist) were first collected at T2 (pre-BMI competition), then BMI monthly and waist three monthly. BMI was measured in kg/m² and waist in centimetres and a measuring protocol was developed to ensure consistency of measuring (Appendix F). As discussed in the BMI competition phase, Champions were responsible for measuring and recording the biophysical measurements, with the support from the researcher. Each organisation was provided with an identical set of scales (digital glass with maximum limit of 180kg), height and waist measuring devices, a BMI chart (showing the ideal weight for height) and a protocol for measuring. Using project equipment ensured the accuracy and comparability of formal and regular measurements. Participants were weighed without shoes, jackets, keys or coins in their pockets. A measurement database for each organisation was created (both electronic and hard copy) for use by the Champions to then send to the researcher. Champions received basic training to ensure consistency of measuring. Furthermore, the researcher was available for any support needed by the Champions, either by phone or by meeting with them.

3.7.1.3 The Coaching Contract

The coaching contract (Appendix I) utilised in the LCP was a tool used to identify health related goals and to measure changes in health behaviours. The tool was adapted from *The Rotary 'Waist' Disposal Challenge* project, which had been piloted with over 40 participants (Aoun et al., 2012). Minor alterations were made to reflect differences in sample composition (i.e., for a young, working population), the objectives of this project, and feedback from researchers working in *The Rotary 'Waist' Disposal Challenge* project, the lifestyle coach and project supervisors.

The tool consisted of two pages, the first covering the contract between the coach and the participant. This included information documented by the lifestyle coach, together with the participant about: weight loss; current and future physical activity; dietary behaviours; alcohol intake; perceived barriers against, and triggers for, change; referrals to health professionals or services; resources; and importantly, established participant goals. The second page was for the coach's use and detailed: participant demographics; coaching session details, such as telephone call attempts and duration; and assessment of stage of change for weight loss, nutrition and physical activity. Following each session, a copy of the contract

(first page) was sent to the participants to remind them of their weight goal(s) and other health related targets they needed to achieve prior to the next session. The original contract was sent to the researcher. The main purpose of the contract was to aid the coaching sessions, however the contract was also used during analysis to compare the self-reported stage of change in the Lifestyle Survey to the coach's reported stage of change.

3.7.2 Qualitative Data Collection

The descriptive exploratory approach requires a method of data collection that represents a reflection of the participant's experiences (Patton, 2002). Qualitative data were collected through semi-structured, open-ended narrative style interviews. In-depth interviewing was used to provide detailed information that facilitated an understanding of the experiences of participants in *The 'Waist' Disposal Program*, and to explore how the program facilitated or hindered participants moving through the stages of change in the adoption of healthy lifestyles. Participants were purposely selected to represent different stages of change (which were identified from the self-report survey), to reflect various experiences with the program and backgrounds, and also to explore the views of forestry workers who chose not to participate in the intervention.

According to Patton (2002), an informal conversation approach allows questions to be individualised and in-depth communication to be established. The interviews were conducted in such a manner as to ensure the participants' accounts were as informative as possible, with minimal interviewer influence. A basic interview guide was used to provide direction for the interviews (Appendix J) that were digitally recorded and then transcribed verbatim. The interview questions were open-ended and semi-structured. Data collection commenced with a broad perspective and became increasingly focused as data were generated. Questions were adapted as necessary throughout the data collection process to expand on concepts or themes that were emerging. The direction of each interview was influenced by the individual participant.

Participants were interviewed in private spaces at a participant's workplace, including office space, sheds and in the field. The locations were chosen for the participants' convenience to provide a relaxed environment, which facilitated rapport between participant and interviewer. The duration of the interviews ranged from 12 to 56 minutes, and participants were contacted following data analysis in order to confirm themes for verification, thereby strengthening the validity of data and enhancing credibility (Lincoln & Guba, 1985).

3.8 Data Analysis

3.8.1 Quantitative Analysis

Quantitative data were managed using the Statistical Package for Social Sciences (SPSS) version 20 software. The normality of distributions was assessed using the Kolmogorov-Smirnov statistic with Lilliefors's significance and the Shapiro-Wilk statistic, and also kurtosis and skewness, as appropriate. Descriptive statistics calculated included the mean, median and standard deviation (SD). Chi-square tests were used for testing relationships among categorical variables, with the Yates correction being applied when one or more cells had an expected count less than five. Relationships between variables were assessed using Spearman's rank order correlation coefficient. Tests of differences when data sets were normally distributed were conducted using paired t-tests; for all other non-normally distributed data the Wilcoxon signed-rank and Friedman's test were applied. Statistical significance was assumed at a *p*-value of <0.05 using two-tailed tests.

3.8.2 Qualitative Analysis

Following data collection, each digitally recorded interview was transcribed verbatim by a secretarial service or by the researcher. The transcriber signed a confidentiality agreement prior to the commencement of the role (Appendix K) and the transcripts were checked for accuracy by the researcher. Data were managed and analysed using NVivo version 10 software. The data analysis process required a holistic procedure to examine all information within its context (Patton, 2002). Accordingly, content analysis using a constant comparison method was selected for this descriptive, exploratory component of the study. The initial phase of content analysis was open coding, which involved identifying key concepts from words or phrases. The interview transcripts were analysed line by line to identify concepts (Strauss & Corbin, 1990). Key concepts were then grouped to form similar categories and sub-categories. Finally, the categories were grouped to form themes. Relational coding was used to articulate relationships between open codes and to identify categories. The constant comparison method was used to identify areas that required more focus and consequently guided further data collection with modification of the interview questions. Two researchers independently coded five transcripts and discussed any discrepancies until consensus was reached. Ongoing analysis was completed by the researcher and the coding was further checked by ongoing discussion with supervisors with an audit trail documenting the coding framework. Discussion of the themes and related categories with supervisors ensured the relevance of the findings reported.

3.9 Rigour of the Research Process

A key strength in using a mixed methods study is the triangulation of data. Triangulation is “the use of multiple methods or perspectives to collect and interpret data about a phenomenon, to converge on an accurate representation of reality” (Polit & Beck, 2010, p.472). Sequential triangulation was used in this study to enhance the rigor and validity of the study by cross-validating qualitative and quantitative data (Creswell, Klassen, Plano Clarke, & Smith, 2011; Polit & Beck, 2014).

In the quantitative component of the research, construct validity was determined by using valid and reliable tools. The Lifestyle Survey was piloted to confirm that the tool was acceptable to the target population, as previously discussed.

Trustworthiness in qualitative research refers to methodological accuracy and adequacy (Holloway & Wheeler, 2010). Trustworthiness of the qualitative research process for this study can be demonstrated by its credibility, dependability, confirmability and transferability (Lincoln & Guba, 1985). Credibility refers to the “confidence in the truth of the data” (Polit & Beck, 2010, p.492). A fundamental strength and weakness of qualitative research, is the active involvement of the researcher (Patton, 2002). To reduce personal bias and enhance credibility, several techniques were applied including ‘bracketing’ whereby the research recognises but also suspends judgement about participants’ experiences with the health program during the qualitative data collection and analysis phase. A member checking technique was applied where three respondents viewed tentative findings of categories and themes to ensure that they accurately captured the essence of their experiences. Furthermore, data were also coded by a research colleague. Credible data requires that sufficient time is spent in its collection (Polit & Beck, 2014). Data collection occurred over a period of several months and the median duration of interviews was 30 minutes. Additional time was required by participants who provided verification of tentative findings.

Dependability requires a systematic and consistent research process (Holloway & Wheeler, 2010; Polit & Beck, 2014), which in turn requires that all decisions and thoughts of the researcher be documented. All decision making was documented throughout the project and can therefore provide a verifiable audit trail (Newell & Burnard, 2011). Furthermore, peer involvement, which is an integral part of the research process (Polit & Beck, 2014), was ensured as the study was closely guided by supervisors and other experts in the field.

Confirmability refers to the objectivity of the qualitative research process (Polit & Beck, 2014) and requires that the research is without bias. The researcher must demonstrate that the findings of the study reflect those of the participants and are not based on their prior assumptions and preconceptions (Holloway & Wheeler, 2010). The researcher was a health professional previously working in the area of primary care, and a self-reflective journal was kept to document the researchers' own assumptions throughout the research process. To avoid bias during data collection, the researcher was aware she was not to disclose her own experiences or preconceptions. This was achieved by structuring the interviews with open-ended narrative-style questions which were established prior to the commencement of the interview process.

Transferability refers to the degree to which the results of qualitative research can be generalised to other settings (Polit & Beck, 2014). By providing sufficient detail about the study's methodology and findings, others will be able to determine its application to other contexts. Furthermore, a comprehensive audit trail including process notes, instrument development, raw data and data reduction was generated for this study.

3.10 Ethical Considerations

Any research involving human subjects requires ethical consideration (Polit & Beck, 2014). The research proposal for this study was submitted to Curtin University's Human Research Ethics Committee (Approval Number HR24/2009) and was also registered by the Australian and New Zealand Clinical Trials Registry (Trial ID ACTRN12609000388213). It was also subject to specific ethical requirements of the organisations providing assistance with delivering the program within their workplaces. This study posed a low risk to its participants, as they were voluntarily making changes to improve their health and enhance their lifestyle, and hence a benefit could be foreseen. A possible risk was that participants could have become concerned about not losing weight. The health professionals involved in the project were experienced in the field of exercise, nutrition and lifestyle behaviour modification, and were also focused on the psychosocial care of participants. It was agreed that should participants become concerned, referral to appropriate agencies would occur. The study's main ethical issues related to informed consent and confidentiality: these were addressed prior to commencement.

3.10.1 Informed Consent

All participants were recruited in such a manner that ensured their participation was voluntary; no coercion was used. All those who expressed interest in participating in the project were given a letter explaining its purpose and method of study and assuring confidentiality specific to each phase (Appendix B). The opportunity was given for questions, and participants were asked to sign declarations confirming informed consent prior to participation at each phase. Participants were free to withdraw from the study at any stage, and in such cases, all information provided by the participant would be deleted.

Declarations of informed consent were stored separately from other data and will remain securely stored for seven years. Furthermore, because of the health data collected during the project, each participant was made aware of available health, counselling and support services should the need occur.

3.10.2 Confidentiality

Every effort was made to guarantee the confidentiality of participants. The organisations that assisted with recruitment of participants have not been identified. The population of men working in industries in rural WA is large; nevertheless, every effort was made to ensure that individuals involved in this study could not be recognised. No names or specific demographic data have been released which could identify participants. All raw data were de-identified by allocating each participant a code. Recordings were destroyed following transcription and all transcripts were assigned a numerical identifier. Only the researcher and thesis committee have had access to the raw data. Throughout the discussion of the study's findings, words identifying particular individuals or organisations have been changed to maintain confidentiality and anonymity of the participants. Research data will be stored for a minimum of seven years after date of publication, or seven years after the conclusion of the project, whichever is later; after the mandatory time, data will be destroyed according to NHMRC and Western Australian University Sector Disposal Authority (WAUSDA) guidelines. Hard copy records will be destroyed by shredding and electronic records will be destroyed by digital file shredding. No participants will be identified in future presentations or subsequent journal articles.

3.11 Summary of the Research Methodology

This chapter has described the mixed method research design and process that was applied to implement a multiphase self-management intervention and gain insight into

attitudes towards healthy lifestyle behaviours of men working in rural WA. Both quantitative and qualitative research methods were used to collect data and to explore ways of engaging men in behaviour change. The setting and sample characteristics have been described, and the process used to analyse data justified. Techniques applied to ensure rigour in the research process have been discussed. Finally, attention to ethical consideration has been detailed.

Chapter Four

Quantitative Findings

4.1 Introduction

This chapter presents the quantitative findings of this research project. The data presented are from the Lifestyle Survey that was collected at four time intervals to capture the impact of the three phases of the intervention (see Figure 3.1, Chapter Three) namely:

Time one (T1): pre-education

Time two (T2): post-education – pre-BMI competition

Time three (T3): mid-BMI competition – pre-lifestyle LCP

Time four (T4): post-BMI competition and LCP.

At T4 some data have been drawn from the Coaching Contracts that were completed during the LCP.

The quantitative findings are presented in three key parts, namely:

1. Profile summary
2. The impact of the intervention at each phase:
 - i. Impact of the education from T1 to T2
 - ii. Impact of the BMI competition from T2 to T3
 - iii. Impact of the LCP from T3 to T4
3. The overall impact of the intervention.

4.2 Profile of Participants Across the Study

4.2.1 Demographic Characteristics of Champions

A total of six Champions were recruited (one in each organisation) of whom four were male and two were female; the four men (median age 46 years) also participated in the project itself. All, except one, held positions in human resources or direct line management. This level of involvement allowed the Champions to have regular contact with their peers and to easily disseminate information from the researcher to the participants.

4.2.2 Demographic Characteristics of Program Participants

A total of 87 participants were involved in phase one (education) of this study (see Table 4.1, T1). The mean age was 41.0 years (SD=10.8) with the youngest participant being 21 years old and the oldest 69 years. All participants were men involved in the forestry industry, 77 (88.5%) of whom had blue-collar occupations, ranging from field foresters to machine operators and mechanics. Ten participants (11.5%) worked in white-collar roles such as management positions, forestry research and planning positions. Two thirds of participants were married (n=58, 66.7%).

A total of 57 participants completed phase one (education) and commenced phase two (BMI competition - see Table 4.1, T2). The average age of T2 participants was similar to T1, whilst drop- out at T2 was more frequent amongst blue-collar workers and less frequent amongst those who were married or in equivalent relationships.

A total of 44 participants completed the survey at T3, which occurred in the middle of phase two (BMI competition- see Table 4.1, T3) and prior to phase three (LCP). Older, married/attached men were still more likely to be involved in the project, with no single participants remaining by this time.

A total of 15 participants completed the final T4 survey, which was post-phase three (LCP - see Table 4.1, T4). Remaining participants were more likely to be older, to work in white-collar roles, and be married or in defacto relationships. Although the transient and unstable nature of the forestry workforce impacted on some participants' ability to remain in the program, it was evident that those men who were younger and single were less likely to continue their participation as the study progressed.

Table 4.1. Demographic characteristics

Characteristic	T1 n=87	T2 n=57	T3 n=44	T4 n=15
Data collection stages of project	Pre-education	Post-education and pre-BMI competition	Mid-BMI competition and pre-coaching	Post-BMI competition and post-coaching
Age (years)				
Mean(SD)	41.0(10.8)	42.0(10.2)	43.7(8.8)	45.5(9.1)
Range	21-69	22-69	27-59	29-59
Occupation - n (%)				
Blue-collar	77(88.5)	48(84.2)	36(81.8)	10(66.7)
White-collar	10(11.5)	9(15.8)	8(18.2)	5(33.3)
Marital Status - n (%)				
Single	11(12.6)	5(8.8)	0	0
defacto	18(20.7)	12(21.1)	8(18.2)	5(33.3)
Married	58(66.7)	40(70.2)	33(75.0)	8(53.3)
Separated/Divorced	0	0	3(6.8)	2(13.3)

4.2.3 Attrition

The attrition between phase one (education) and two (BMI competition) was 34.5 percent (n=87 down to n=57). The attrition of 30 participants was a result of three key factors, namely leaving employment at the participating forestry organisation, non-compliance to complete the survey, or lack of interest in continuing with the project. There were participants who wanted to participate in the BMI competition, but did not wish to complete the survey and therefore were not included in the analysis of this work. Including these participants in analysis would result in a much lower attrition rate between phase one and two (13.8%). Attrition during the BMI competition was 22.8 percent. Subsequent attrition between participants who completed the BMI competition (n=44) and those who progressed into the LCP (n=15) was 65.9 percent.

4.2.4 Risk Factor Profile

Tables 4.2 and 4.3 provide a snapshot of the risk factor profile of participants across all four time points. The impact of the intervention on different risk factors will be examined in detail in future sections, by comparing results between time points for the same group of participants.

Table 4.2. Risk factor profile

	T1 (n=87)	T2 (n=57)	T3 (n=44)	T4 (n=15)
Medical Status				
With reported medical conditions e.g. hypertension, asthma, depression, n (%)	22 (22.6)	15 (26.8)	15 (34.1)	4 (26.7)
Taking medications, n (%)	24 (28.2)	14 (25.0)	16 (36.4)	5 (33.3)
Alcohol				
Consuming alcohol, n (%)	79 (90.8)	50 (87.7)	35 (83.3)	12 (80.0)
Median standard drinks per week, n (range)	10 (1-90)	10 (1-50)	5.5 (1-30)	4 (1-10)
Smoking				
Individuals who smoke, n (%)	23 (26.4)	10 (17.5)	8 (18.2)	0 (100)
Median n cigarettes per week (range)	80 (10-350)	74 (20-300)	49 (5-200)	0
Nutrition Fat and Fibre Barometer (score 9-45) the higher the value the healthier the participant's dietary intake				
Mean (SD)	27.1 (5.6)	28.5 (4.6)	30.7 (3.7)	31.7 (4.0)
Median (range)	27 (14-41)	28.5(20-41)	30(24-42)	32(25-39)
Physical Activity				
Total median exercise time per week, hours (range)	4 (0-38)	6 (0-38)	5.25 (0.83-19)	6 (3-14.5)
Sedentary (i.e., no exercise per week), n (%)	11 (12.6)	3 (5.3)	0	0
Insufficient (i.e., <2.5hrs exercise per week), n (%)	9 (10.3)	10 (17.5)	6 (13.6)	0
Sufficient (i.e., >2.5hrs exercise per week), n (%)	67 (77.0)	44 (77.2)	38 (86.4)	15 (100.0)

Medical Status

The proportion of participants reporting one or more medical conditions varied between 22.6 percent and 34.1 percent (Table 4.2) and the presence of medical conditions does not seem to have deterred individuals from continuing with the program across the stages. Reported conditions included asthma, hypertension, high cholesterol, depression, anxiety and cancer, and the percentage of participants with medical conditions was roughly consistent

across the four time intervals. At all-time points, hypertension was the most reported condition, followed by asthma.

Participants reported taking various medications including anti-hypertensives, cholesterol lowering medications, corticosteroids and allergy related medications. Those who reported taking medications appeared more likely to continue through to the latter phases of the project.

Alcohol Consumption and Smoking

At T1 as many as 90.8 percent of participants reported drinking alcohol, whereas this had reduced to 80.0 percent by T4. The average amount of alcohol consumed by participants reduced considerably as participants moved through the phases, i.e., a median of 10 standard drinks per week at T1 compared to 4 at T4 (Table 4.2). Participants who consumed large volumes of alcohol tended not to continue through to the later phases of the project.

Participants who reported smoking were also less likely to remain in the program over time. Whereas at T1 26.4 percent of participants reported smoking an average of 116.4 cigarettes per week, none of the participants at T4 reported smoking at all (Table 4.2). Of those who smoked cigarettes, all were from blue-collar occupations.

Nutrition

The FFB was used to measure nutritional intake, with possible scores ranging from nine to 45 (the higher the value the healthier the participant's dietary intake). The mean score increased for participants as they progressed through the phases, i.e., mean 27.1 at T1 compared to 31.7 at T4 (Table 4.2).

Physical Activity

The majority (77%) of participants recruited at the commencement of this project already exercised at a sufficient level as defined by the National Guidelines, i.e., at least 2.5 hours per week (DoHA, 2010). By the end of the project (T4), however, this proportion had increased to 100 percent.

Body Mass Index and Waist Measurements

As discussed in detail in Chapter Three (Methodology), biophysical measurements (BMI and waist circumference) were first collected at T2. Measurements were collected

monthly, but for the purpose of exploring the impact of the interventions, three key time intervals are highlighted (T2 pre BMI, T3 mid BMI, T4 post BMI/post LCP). At T4 there were two groups, namely the group who participated in the BMI competition only and those who completed the BMI competition and the LCP. At T2, 49 percent of men were in the overweight category, with 35 percent in the obese category. The mean BMI was 29.4 kg/m² (Table 4.3), which is considered overweight. Similarly, mean waist measurement at T2 was 102.0cm, which is above the recommended value of 94cm for men (NHMRC, 2013a). Although individual changes in BMI and waist measurements were apparent, the group's average BMI and waist distribution remained relatively stable across the phases. This is despite the fact that those with lower BMI (within the healthy range) and lower waist circumference were more likely to drop out, as inferred by the higher minimum measurements as the study progressed, and is presumably because these healthier individuals did not have the same need for the program as those who were overweight.

Table 4.3. BMI and waist measurements

	T2 n=57	T3 n=44	T4 n=37	
			BMI only n=22	BMI and LCP n=15
BMI (kg/m²)*				
Mean (SD)	29.4 (4.6)	29.3 (4.3)	29.7 (5.2)	29.0 (1.9)
Median	29.2	29.0	28.5	29.1
Range	22.0-41.5	22.6-40.4	23.1-41.7	26.2-33.0
Waist Measurement				
Mean (cm) (SD)	102.0 (12.6)	101.6 (12.1)	102.1 (14.3)	102.9 (6.4)
Median (cm)	99.5	100.5	98.5	103.0
Range (cm)	83-138.9	83-136.8	85-132.0	89-110.0

*BMI Categories: 18.5-24.9 kg/m²= normal weight; 25-29.9 kg/m²=overweight; >30kg/m² = obese

4.3 The Impact of the Intervention at Each Phase

4.3.1 Impact of Education (Time 2 v Time 1, n=57)

As described in detail in Chapter Three (Methodology), 21 education sessions were delivered to men working in the forestry industry. The sessions covered three key areas, namely: 1. Nutrition, 2. Physical activity, and 3. Healthy lifestyle behaviours. The education sessions were well attended, with the majority of available employees attending the sessions delivered during within their workplace. Fifty seven participants completed pre-and post-education surveys. The findings of these data are presented here. As will be seen, the differences found and noted were typically small, though in the ‘right’ direction.

Alcohol Consumption and Smoking

As a group almost 90 percent of participants reported drinking alcohol at T1 and 88 percent at T2, Table 4.4 demonstrates a non-significant small shift towards lower consumption at T2.

Table 4.4. Alcohol consumption T1/T2

Alcohol Consumption (standard drinks per week)	T1 n (%)	T2 n (%)
0	6 (11.1)	7 (13.0)
1 to 10	27 (50.0)	27 (50.0)
11 to 50	18 (33.3)	19 (35.2)
51 or more	3 (5.6)	1(1.9)
Total	54 (100)	54 (100)

Chi-square=0.163, df=2, $p=0.92$

Twenty one percent of the 57 participants reported smoking at T1, compared to 18 percent at T2. There was also a reduction in the median number of smoked cigarettes, from 84 per week (min=15, max=350) at T1 to 74 per week at T2 (min=20, max=300). These differences are not statistically significant.

Nutrition

As a group, there was minimal to no change in the nutritional intake of participants, with the median score for the FFB being 28 at both T2 and T1. When examining the change in nutritional intake distribution at an individual level for each of the nine categories on the FFB, education produced little change; however it is evident that the greatest nutritional improvement following the educational sessions was in selecting lean meat, whereas the least improvement (actually a worsening) related to consuming wholegrain products (Table 4.5). At T2 14.3 percent of participants reported “always” selecting lean meat compared to only 8.9 percent at T1. There was also a positive shift towards increased adequate fruit intake on 3-5 days of the week at T2 compared to T1, whereas there was a smaller decrease of intake on more than six days per week (Figure 4.1). The same was true for vegetable intake (Figure 4.2). Although there were some small shifts in the “right” direction for reduced consumption of take away foods and for reducing the need to use fat when cooking, this is more difficult to identify in Figures 4.3 and 4.4.

Table 4.5. Summary of nutritional intake changes T1/T2

	Number of participants		
Intake	No change	Improved	Worsened
Fruit	37	12	7
Vegetable	34	11	11
Lean Meat	30	15	8
Take away	42	6	8
Cooking with Fat	35	14	7
Whole-grain	33	10	15
Legumes	37	13	6
Low Fat Dairy	34	13	9
Processed Meat	37	12	7

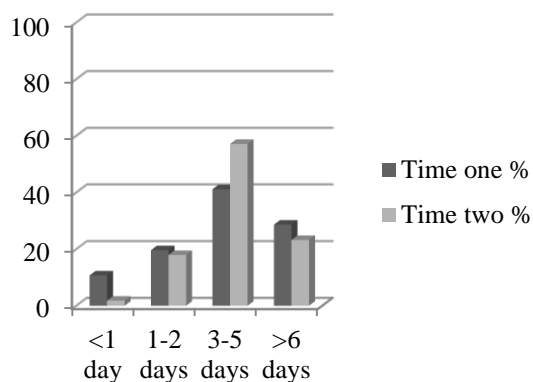


Figure 4.1. Percentage of fruit consumption (>2 more pieces per day) at various frequencies T1/T2

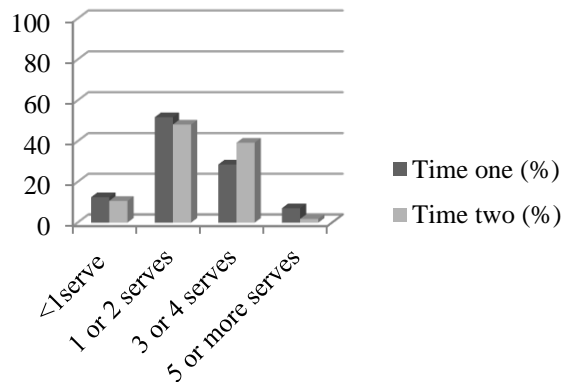


Figure 4.2. Percentage of daily vegetable consumption T1/T2

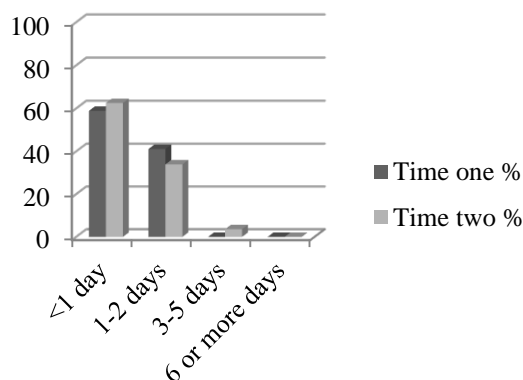


Figure 4.3. Percentage take away consumption at various frequencies T1/T2

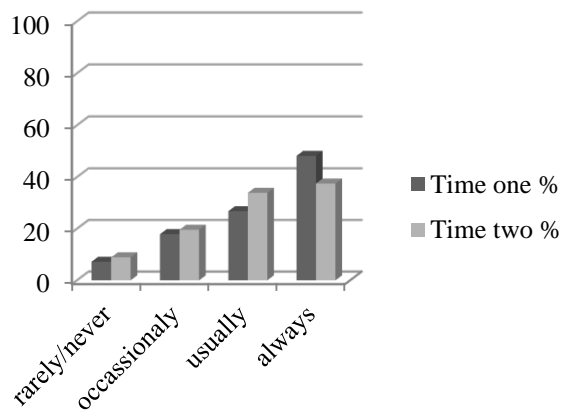


Figure 4.4. Percentage of participants using fat when cooking at various frequencies T1/T2

Physical Activity

There was a change in the level of physical activity reported by participants subsequent to the education sessions. Although the majority of participants were achieving sufficient activity levels (more than 2.5 hours per week) at both T1 and T2, the total median exercise time increased at T2. The median number of days and time participants walked remained unchanged, but marginally more reported conducting vigorous physical work (Table 4.6).

Table 4.6. Summary of physical activity changes T1/T2

Physical Activity Variable	T1	T2
Median total time exercising: hours per week (range)	4 (0-38)	6 (0-38)
Median days per week (hours per day) walked	3 (2)	3 (2)
% of participants reporting vigorous physical work (such as gardening, heavy work around the house)	47.2	51.8
Vigorous activity: median days per week (hours per day)	1 (2)	2 (4)
% of participants reporting moderate activity	34.0	29.6
Sedentary [0 hrs], n (%)	5 (8.8)	3 (5.3)
Insufficient [<2.5 hrs], n (%)	5 (8.8)	10 (17.5)
Sufficient [>2.5hrs], n (%)	47 (82.5)	44 (77.2)

Stage of Change

Stages of change were measured for weight loss, reducing fat intake and exercising (Table 4.7).

Table 4.7. Stage of change- Weight loss, fat intake and exercise T1/T2

	Stage of change Weightloss T1/T2		Stage of change Fat intake T1/T2		Stage of change ExercisingT1/T2	
	T1 n (%)	T2 n (%)	T1 n (%)	T2 n (%)	T1 n (%)	T2 n (%)
Pre-contemplation and Contemplation	27 (48.2)	19 (33.9)	22(39.3)	14(25.0)	15(27.3)	14(25.5)
Preparation	7 (12.5)	12 (21.4)	3(5.4)	10(17.9)	7(12.7)	11(20.0)
Action and Maintenance	22 (39.3)	25 (44.6)	31(55.4)	32(57.1)	33(60.0)	30(54.5)
Total	56 (100)	56 (100)	56(100)	56(100)	55 (100)	55(100)
	Chi-square=2.90, df=2, $p= 0.23$		Chi-square=5.56, df=2, $p= 0.06$		Chi-square=1.07, df=2, $p= 0.59$	

Weight Loss

Following the education sessions, more participants had moved to the preparation stage and were in the action or maintenance stage of change than at T1 (Table 4.7). When considered at an individual level across the five distinct stages of change, 32 participants remained in the same stage of change for weight loss following the education sessions, with 16 having progressed towards psychological readiness for weight loss (mostly to the preparation and action stage) and eight having regressed mostly from the action to preparation stage of change in the post-education follow-up survey. Therefore, as expected the proportion in the pre-contemplation/contemplation phases decreased while those in the preparation and action/maintenance increased.

Reducing Fat Intake

In their readiness to change fat intake, the proportion in the pre-contemplation/contemplation phases decreased while those in the preparation stage increased, and the proportion of those in the action/ maintenance stage stayed constant, in line with what is expected (Table 4.7). Whilst not statistically significant it was close to showing significance ($p= 0.06$).

On an individual level across the five distinct stages of change, 32 participants remained in the same stage of change for reducing fat intake between the pre and post education survey, while 15 participants progressed in their readiness to reduce their fat intake (mostly to

preparation and action stages) and seven participants regressed mostly from the action to preparation stage of change.

Exercising

While more participants had moved to the preparation stage at T2, the proportion in the action/maintenance stage had slightly reduced (Table 4.7). When T1 and T2 are compared on an individual level, most participants (31) remained in the same stage of change for exercise at the time of the post education survey, whilst 11 had progressed (mostly to the action stage) and 12 regressed mostly from action to the preparation stage of change.

Self-Efficacy

The mean overall self-efficacy scores showed no significant change (Paired sample t-test $t(52) = -1.4$, $p = 0.18$) (Table 4.8) though a small, non-significant increase in overall motivation for lifestyle change following the educational sessions may be apparent.

Table 4. 8. Self-efficacy scores for nutrition, exercise, and overall T1/T2

	T1 Mean (SD)	T2 Mean(SD)
Self-efficacy- Nutrition,* $p= 0.17$	25.7(6.6)	27.1(5.9)
A. Stick to your low fat, low salt foods.	3.31(1.13)	3.62(1.03)
B. Eat smaller portions	3.23(1.10)	3.40 (1.04)
C. Eat lunch as your main meal of the day, rather than dinner.	2.68(1.24)	2.82(1.09)
D. Eat salads for lunch.	3.50(1.24)	3.49(1.25)
E. Eat low salt foods.	3.28(1.28)	3.51(1.17)
F. Eat vegetarian entrees for dinner.	3.11(1.51)	3.15(1.35)
G. Substitute low or non-fat milk for whole milk at dinner.	3.67(1.52)	3.95(1.47)
H. Cut down on gravies and cream sauce.	3.31(1.29)	3.49(1.19)
Self-efficacy- Exercise, $p= 0.26$	27.4 (8.4)	28.2 (7.0)
I. Get up early, even on weekends, to exercise.	3.51(1.35)	3.43(1.19)
J. Stick to your exercise program when you are tired or stressed.	3.30(1.25)	3.40(1.19)
K. Do a physical activity program of continuous activities for at least 30 minutes, 3 times per week.	3.78(1.22)	3.71(1.18)
L. Continue to exercise with others even though they seem too fast or too slow for you.	3.81(1.13)	3.84(1.01)
M. Stick to your exercise program when you have other family or household jobs to do.	3.42(1.18)	3.47(1.10)
N. Stick to your exercise program even when you have excessive demands at work.	3.06(1.20)	3.27(1.13)
O. Stick to your exercise program when social obligations are very time consuming.	3.30(1.22)	3.44(1.05)
P. Read or study less in order to exercise more.	3.65(1.20)	3.67(1.10)
Overall Self-efficacy,**$p= 0.18$	53.0(12.2)	55.3(10.2)

* adhering to low salt, low fat foods and reducing portion size

**Self-efficacy scores range from 16 to 80. The higher the score the more confident participants are to achieve healthy diet and exercise behaviours.

Summary of the Impact of Education

In summary, whilst not statistically significant there were some important changes evident, albeit small, following the education sessions. There were similar numbers of participants consuming alcohol; however the level of consumption was less at T2 compared to T1. Slight improvements were noted in nutritional intake also. The majority of participants were already achieving sufficient activity levels at both T1 and T2, so minimal changes were noted for exercise. It was hypothesised that by delivering phase one of the intervention (education presentations), participants would move from the pre-contemplation stage to the contemplation stage of change; that is, they would be actively contemplating lifestyle change, and to some extent this occurred. Non-statistically significant, but generally positive, changes were noted in participants' psychological readiness to modify behaviours relating to weight loss, fat intake and exercise. There was also a positive trend towards action and maintenance stage of change for all three measures. Statistically, this trend was not significant, although the readiness to reduce fat intake was close to being so with a *p* value of 0.06.

4.3.2 Impact of BMI Competition (Time 3 v Time 2, n=44)

The BMI competition, which was described in detail in Chapter Three, was delivered over 12 months, and consisted of a monthly monitoring of BMIs. Within each organisation a Champion self-nominated to be responsible for the delivery of the project to his peers. The Champion assisted with logistical matters with the project and most pertinently was responsible for conducting monthly weigh-ins. Champions were also required to motivate their peers and encourage them to adopt a healthy lifestyle, including healthy diet and exercise. Champions were in regular contact with the researcher and received material to assist in this role, such as educational flyers and posters, promotional brochures, recipes, and physical activity tips.

Six months into the BMI competition, 44 participants completed a third survey (T3). In order to measure the effectiveness of the first part of the BMI competition, the results at T3 were compared to those from the survey completed prior to the commencement of the BMI competition and at completion of the educational sessions (T2). As for the impact of BMI competition, the differences found and noted are typically small, albeit in the 'right' direction. Where they are statistically significant, this is specified.

Alcohol Consumption and Smoking

While table 4.9 shows little impact on the number of participants drinking alcohol, for the group as a whole the median number of standard drinks per week reduced by nearly half, from 10 at T3 to 5.50 at T2 (see Table 4.3), and the Wilcoxon signed-rank test indicated significant individual changes in alcohol consumption ($z = -2.10, p = 0.03$).

Table 4.9. Alcohol consumption T2/T3

Alcohol Consumption (number of standard drinks per week)	T2 n (%)	T3 n (%)
0	7 (15.9)	8 (18.2)
1 to 10	23 (52.3)	28 (63.6)
11 to 50	14 (31.8)	8 (18.2)
51 or more	0 (0)	0 (0)
Total	44 (100)	44 (100)

Chi-square=2.19, df=2, $p = 0.33$

There were slightly more participants who reported smoking at T3 compared to T2 (18.2% compared to 13.6%). As a group, the median number of cigarettes smoked reduced from 60 per week at T2 to 49 per week at T3, however the Wilcoxon signed- rank test doesn't suggest significant individual changes ($z=0.69$, $p= 0.49$).

Nutrition

There was a small improvement in nutritional intake for the group as a whole during the first six months of the BMI competition, with the median score for the FFB at T3 being 30 compared to 29 at T2. The greatest nutritional improvement from T2 to T3 was a reduction in the use of oil or butter in cooking, followed by an increase in the consumption of legumes (Table 4.10). Fruit intake on more than six days a week was the case for 34.1 percent at T3, compared to only 20.5 percent at T2 (Figure 4.5) and there was an increase in the consumption of vegetables daily (Figure 4.6). There was a marginally positive shift in participants choosing not to have take-away foods (Figure, 4.7) and not to cook with fat as frequently (Figure 4.8).

Table 4.10. Summary of nutritional intake changes T2/ T3

Intake	Number of participants		
	No Change	Improved	Worsened
Fruit	23	12	9
Vegetable	25	15	4
Lean Meat	28	12	4
Take away	28	11	5
Cooking with Fat	20	18	6
Whole-grain	23	11	10
Legumes	23	17	4
Low Fat Dairy	26	13	5
Processed Meat	25	11	8

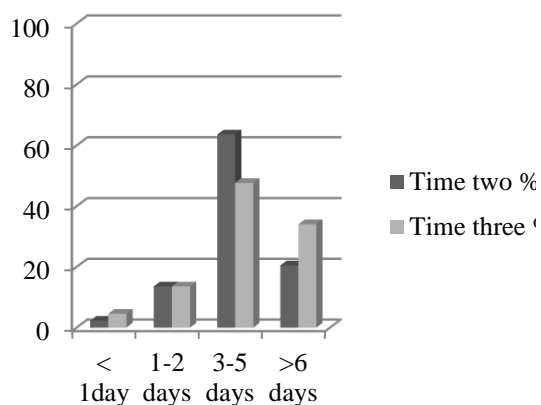


Figure 4.5. Percentage of fruit consumption (>2 more pieces per day) at various frequencies) T2/T3

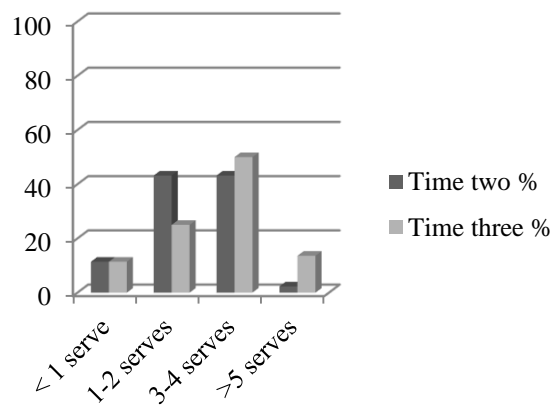


Figure 4.6. Percentage of vegetable consumption T2/T3

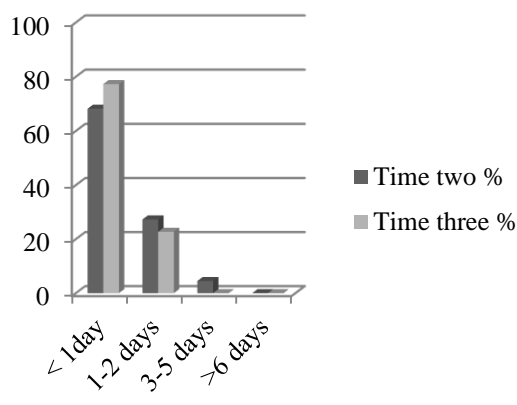


Figure 4.7. Percentage take away consumption at various frequencies T2/T3

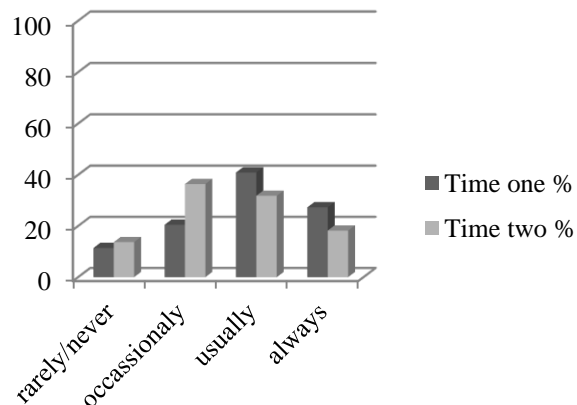


Figure 4.8. Percentage of participants using fat when cooking at various frequencies T2/T3

Physical Activity

Overall exercise levels between T2 and T3 remained similar. More participants reported conducting vigorous physical work at T3 compared to T2, yet for the group as a whole the median number of days that this was achieved decreased, as did the duration. Although there was a slight decrease in the median total time spent exercising at T3 (5.25 hours per week compared to six hours at T2), the majority of participants were achieving ‘sufficient’ activity levels at T3 and T2 (86.4% at T3 and 77.3% at T2) (Table 4.11).

Table 4.11. Summary of physical activity changes T2/ T3

Physical Activity Variable	T2	T3
Median total time exercising: hours per week (range)	6 (0-19)	5.25 (0.83-19)
Median days per week (hours per day) walked	3 (2)	3 (2)
% of participants reporting vigorous physical work (such as gardening, heavy work around the house)	47.7	62.8
Vigorous activity: median days per week (hours per day)	2 (3.5)	1.5 (2)
% of participants reporting moderate activity	28.6	27.3
Sedentary [0 hrs], n (%)	1 (2.3)	0
Insufficient [<2.5 hrs], n (%)	9 (20.5)	6 (13.6)
Sufficient [>2.5hrs], n (%)	34 (77.3)	38 (86.4)

Stage of Change

Stages of change were measured for weight loss, reducing fat intake and exercising (Table 12).

Table 4.12. Stage of change- Weight loss, fat intake and exercise T2/T3

	Stage of change Weight loss T2/T3		Stage of change Fat intake T2/T3		Stage of change Exercising T2/T3	
	T2 n (%)	T3 n (%)	T2 n (%)	T3 n (%)	T2 n (%)	T3 n (%)
Pre-contemplation and Contemplation	14 (31.8)	11 (25.0)	9 (20.5)	5 (11.4)	9 (20.5)	5 (11.4)
Preparation	10 (22.7)	3 (6.8)	8 (18.2)	4 (9.1)	10 (22.7)	1 (2.3)
Action and Maintenance	20 (45.5)	30 (68.2)	27 (61.4)	35 (79.5)	25 (56.8)	38 (86.4)
Total	44 (100)	44 (100)	44 (100)	44 (100)	44 (100)	44 (100)
	Chi-square=6.13, df=2, <i>p</i> = 0.04		Chi-square=3.51, df=2, <i>p</i> = 0.17		Chi-square=8.75, df=2, <i>p</i> = 0.01	

Weight Loss

Following six months of the BMI competition there was a statistically significant ($p=0.04$) shift in participants' stage for weight loss towards the action and maintenance phase (68.2% of participants at T3 compared to 45.5% at T2) (Table 4.12)

Individual comparisons between T2 and T3 across the distinct five stages of change showed that 26 participants remained in the same stage for weight loss following six months of the BMI competition, with 13 having progressed in their readiness to achieve weight loss (mostly preparation to action stage) and five having regressed by one stage of change; no trend evident with regressions across all stages of change.

Reducing Fat Intake

At mid-point in the BMI competition, as many as 80 percent of participants at T3 were in the action/ maintenance stage of change in their readiness to reduce fat intake compared to 60 percent at T2. There was a small shift from the pre-contemplation/contemplation and preparation phases to the action and maintenance phase (Table 4.12).

Again, although the group comparisons above show a small positive shift, the individual comparisons showed that 21 participants remained in the same stage of change for reducing

fat intake between the pre and mid-BMI competition survey, while 16 participants progressed in their readiness to reduce their fat intake (mostly preparation to action stage) and seven participants regressed, mostly from the action to preparation stage of change.

Exercising

At T3, as many as 86.4 percent of participants were in the action or maintenance stage of change related to exercising, compared to 56 percent at T2. Furthermore there was a large, statistically significant shift ($p= 0.01$) (Table 4.12), from the preparation to action and maintenance phases.

Twenty three participants remained in the same stage of change for exercise mid-BMI competition, while 17 progressed (mostly in the preparation to action stage) and three regressed from maintenance to action and from preparation to contemplation when examined on an individual level across the five distinct stages of change.

Self-Efficacy

The average self-efficacy scores (overall) showed no change between T2 compared to T3 (Paired sample t-test for overall self-efficacy: $t(41) = -0.92$; $p= 0.36$) (Table 4.13).

Table 4.13. Self-efficacy nutrition, exercise and overall T2/T3

	T2 Mean (SD)	T3 Mean (SD)
Self-efficacy– Nutrition,* $p= 0.34$	27.81 (5.75)	28.39 (5.74)
A. Stick to your low fat, low salt foods.	3.70 (0.94)	3.79 (0.94)
B. Eat smaller portions	3.39 (1.02)	3.65 (0.94)
C. Eat lunch as your main meal of the day, rather than dinner.	2.98 (0.98)	2.86 (1.12)
D. Eat salads for lunch.	3.63 (1.17)	3.72 (1.14)
E. Eat low salt foods.	3.65 (1.09)	3.79 (1.05)
F. Eat vegetarian entrees for dinner.	3.16 (1.25)	2.88 (1.31)
G. Substitute low or non-fat milk for whole milk at dinner.	4.02 (1.46)	4.05 (1.27)
H. Cut down on gravies and cream sauce.	3.60 (1.05)	3.65 (0.87)
Self-efficacy – Exercise, $p= 0.33$	28.28 (6.47)	28.34 (6.85)
I. Get up early, even on weekends, to exercise.	3.40 (1.16)	3.35 (1.23)
J. Stick to your exercise program when you are tired or stressed.	3.47 (1.09)	3.58 (1.02)
K. Do a physical activity program of continuous activities for at least 30 minutes, 3 times per week.	3.81 (1.03)	3.86 (1.16)
L. Continue to exercise with others even though they seem too fast or too slow for you.	3.86 (0.91)	3.86 (1.01)
M. Stick to your exercise program when you have other family or household jobs to do.	3.44 (1.12)	3.37 (1.13)
N. Stick to your exercise program even when you have excessive demands at work.	3.21 (1.04)	3.12 (1.00)
O. Stick to your exercise program when social obligations are very time consuming.	3.40 (0.95)	3.44 (1.03)
P. Read or study less in order to exercise more.	3.70 (1.40)	3.77 (1.21)
Overall Self-efficacy,** $p= 0.36$	56.0 (9.52)	56.7(10.59)

* adhering to low salt, low fat foods and reducing portion size

**Self-efficacy scores range from 16 to 80. The higher the score the more confident participants are to achieve healthy diet and exercise behaviours

Body Mass Index and Waist Measurements

For the group as a whole, there was only minimal change in the median BMI between T2 (29.2 kg/m²) and T3 (29.0 kg/m²). However, the Wilcoxon signed-rank test does indicate that significant individual changes in BMI had occurred between T2 and T3 ($z = -3.71$, $p < 0.001$). Whilst the BMI of 19 participants decreased, 15 gained weight and 10 remained the same.

There was also a slight reduction in median waist measurements as a group at T3 (median = 100.5cm) compared to at T2 (median = 101.2cm) (Table 4.14) and the Wilcoxon signed-ranked test also indicate significant individual change in waist measurements ($z = -3.58$, $p < 0.001$).

Table 4.14. BMI and waist measurements T2/T3

	T2	T3
BMI (kg/m²)		
Mean (SD) ($z = -3.71$, $p < 0.001$)	29.7 (4.5)	29.3 (4.3)
Median	29.2	29.0
Range	22.7-41.5	22.5-40.4
Waist Measurement (cm)		
Mean (SD) ($z = -3.58$, $p < 0.001$)	102.2 (12.9)	101.0 (12.1)
Median	101.2	100.5
Range	83.0-138.0	83.0-136.8

Summary of the Impact of the BMI Competition

In summary, there were some small but positive shifts towards healthy lifestyle behaviours by mid-BMI survey. There was an overall reduction in the number of participants consuming alcohol and also in the amount of alcohol consumed. Although there were more participants who reported smoking, fewer cigarettes were being smoked. There were minimal changes evident in nutritional intake. The type of exercise performed remained relatively unchanged between T2 and T3; however, the total time exercising per week increased slightly and at T3 there were no participants in the sedentary category, with all doing some level of exercise. It was hypothesised that by delivering phase two of the intervention (BMI

competition), participants would move from the contemplation to preparation stage of change; to some extent this was confirmed. In addition, there were relatively large (and statistically significant) shifts from the preparation to action and maintenance stages of change, for both weight loss and exercise. This was also seen in small but significant changes in BMI and waist measurements.

4.3.3 Impact of Lifestyle Coaching Program (LCP) (Time 4 v Time 3, n=15)

The LCP was offered as a pilot to eligible participants as a third phase of the intervention. Described in detail in Chapter Three (Methodology), the LCP was delivered to 15 men working in the forestry industry. It included coaching sessions from an experienced lifestyle coach over the telephone, who adopted the MI technique to encourage participants to change their behaviours. The men were all offered up to four sessions with a lifestyle coach. Participants were identified from the BMI competition and were invited to take part in this third phase. The inclusion criteria were:

1. BMI ≥ 25 kg/m²; and
2. Availability for period of data collection.

A total of 51 sessions were conducted with 15 participants. The higher dropout rate in the LCP will be discussed later, as the somewhat lower sample in this phase than the original power analysis required, limits what overall conclusions can be made. Participants completed a survey at conclusion of the LCP (T4) as well as a Coaching Contract with the coach at each session. It was initially planned that coaching sessions would be conducted on a monthly basis, and that a participant would be offered up to four such sessions. This number of sessions was dependent on a participant's commitment to continue and the coach's professional judgement. The majority (53.3%) of participants completed four sessions (Table 3.2). Of the two participants who completed only two sessions, work and other commitments were reported as the main barriers to ongoing participation. The main barriers to achieving healthy lifestyle changes included work commitments (including long working hours), family commitments (particularly young children) and physical problems (such as a knee injury).

Table 4.15. Number of coaching sessions

Number of Coaching Sessions Completed	Participants n (%)
One	0
Two	2(13.3)
Three	5(33.3)
Four	8(53.3)
Total	15(100)

The median time between sessions was 4 weeks (range = 4-12 weeks). The median duration of coaching sessions was 27.5 minutes (range 10-40 minutes). The first session (baseline) was the longest as it was necessary to develop a good rapport between the lifestyle coach and the participant and to establish a plan of action to be achieved by the next coaching session. Nine of the 15 participants received additional resources from the coach. These resources included Fact sheets from the Better Health Channel, recipes, and information on meal portion sizes. The impact of the LCP is presented here.

Alcohol Consumption and Smoking

The majority of participants reported drinking alcohol at T3 (73.3%) and T4 (80.0%) (Table 4.16), however for the group as a whole the median number of standard drinks per week reduced from eight at T3 to four at T4. There were three (20%) of the 15 participants who reported smoking at T3, whereas none smoked at T4.

Table 4.16. Alcohol consumption T3/T4

Alcohol Consumption (standard drinks per week)	T3 n (%)	T4 n (%)
0	4 (26.7)	3 (20.0)
1 to 10	9 (60.0)	12 (80.0)
11 to 50	2 (13.3)	0 (0)
51 or more	0 (0)	0 (0)
Total	15 (100)	15 (100)

Nutrition

As a group, there was an improvement in the nutritional intake of participants demonstrated by the post LCP survey, with the median score for the FFB at T4 being 32, compared to 29 at T3. The Wilcoxon signed-ranked test also suggests that statistically significant positive changes occurred in nutrition between T3 and T4 ($z = -2.20$, $p = 0.03$).

On an individual level most participants did not change or else improved their nutritional intake. The greatest nutritional improvement following the LCP sessions related to selecting low fat dairy products (Table 4.17). There was a positive shift in fruit intake with the number of participants reportedly eating adequate fruit intake on 3-5 days doubling, but fewer reporting adequate fruit intake on more than six days (Figure 4.9). The participants consuming 3-4 serves of vegetables at T4 increased more than a third from T3 (Figure 4.10).

There was no change in participants' take away food intake, but a small shift in the number of participants choosing lean meat "usually and always" at T4 compared to T3, and more participants reportedly "never/ rarely" using fat when cooking (Figures 4.11 and 4.12).

Table 4.17. Summary of nutritional intake changes T3/T4

Intake	Number of participants		
	No change	Improved	Worsened
Fruit	11	2	2
Vegetable	8	5	1
Lean Meat	9	5	1
Take away	13	1	1
Cooking Fat	11	3	1
Whole-grain	11	1	2
Legumes	11	2	2
Low Fat Dairy	6	7	2
Processed Meat	10	4	1

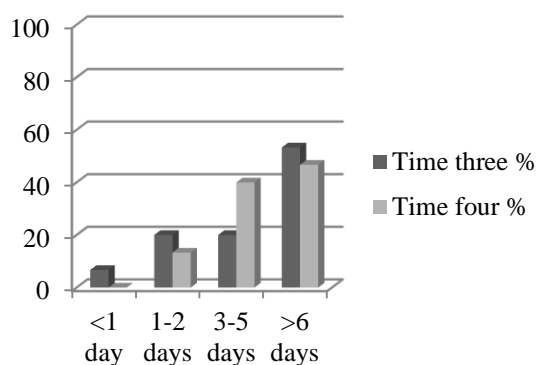


Figure 4.9. Percentage of fruit consumption (>2 more pieces per day) at various frequencies T3/T4

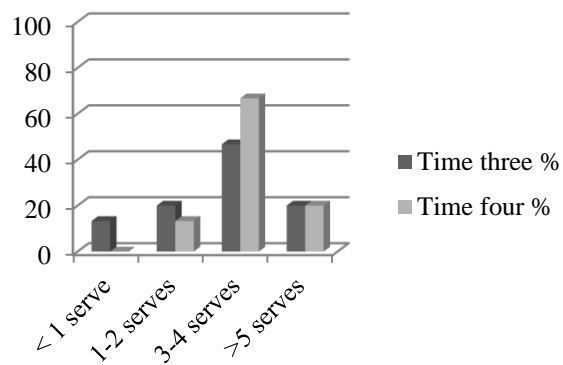


Figure 4.10. Percentage of daily vegetable consumption T3/T

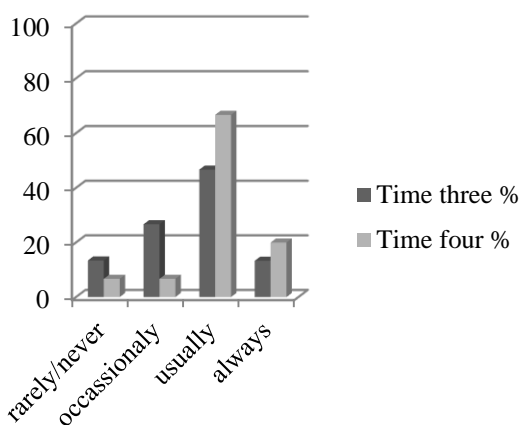


Figure 4.11. Percentage of lean meat consumption at different frequencies T3/T4

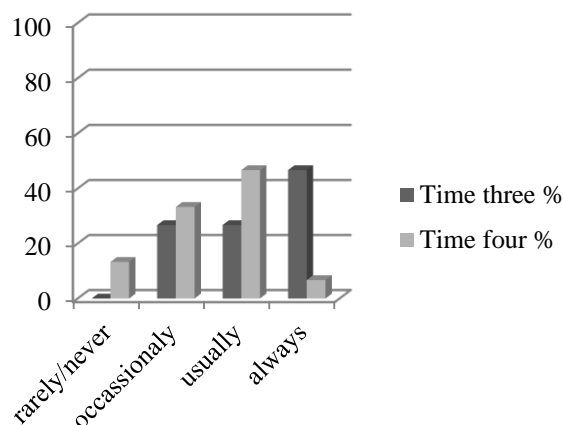


Figure 4.12. Percentage of participants using fat when cooking at various frequencies T3/T4

Physical Activity

All participants were achieving sufficient activity levels (more than 2.5 hours per week) by T4 compared to 86.7 percent at T3. For the group as a whole, the median number of days participants walked increased following the lifestyle coaching. Fewer participants reported conducting vigorous physical work at T4 (60.0%) compared to T3 (66.7%). Although the median number of days where this was performed increased from one to 1.5, the median duration decreased from 2.75 hours to two hours by T4 (Table 4.18). The Wilcoxon signed-rank test indicates a significant individual difference in total time exercising between T3 and T4 ($z = -2.05$, $p = 0.04$).

Table 4.18. Summary of physical activity changes T3/T4

Physical Activity Variable	T3	T4
Median total time exercising: hours per week (range)	4.5 (2-12)	6 (3-14.5)
Median days per week (hours per day) walked	3 (2)	4 (2.5)
% of participants reporting vigorous physical work (such as gardening, heavy work around the house)	66.7	60.0
Vigorous activity: median days per week (hours per day)	1(2.75)	1.5(2)
% of participants reporting moderate activity	33.3	46.7
Sedentary [0 hrs], n (%)	0	0
Insufficient [<2.5 hrs], n (%)	2 (13.3)	0
Sufficient [>2.5hrs], n (%)	13 (86.7)	15 (100)

Stage of Change

Stage of change was measured for weight loss, reducing fat intake and exercising (Table 19). These were measured through the self-report Lifestyle Survey as in previous sections. The lifestyle coach also assessed the participants' stage of change during the coaching sessions. Spearman's rho correlation coefficients demonstrated a significant statistical difference between the self-report and coach's stage of change for weight loss ($p = 0.02$), but not for fat intake ($p = 0.11$) nor exercise ($p = 0.08$). Participants were more likely to report later stages of change than the coach for all stages of change (weight loss, physical activity and

nutrition). Due to the subjective nature of the stage of change measure and for consistency with previously reported measures, the self-reported data is presented here.

Table 4.19. Stage of change - Weight loss, fat intake and exercise T3/T4

	Stage of change Weight loss T3/T4		Stage of change Fat intake T3/T4		Stage of change Exercising T3/T4	
	T3 n (%)	T4 n (%)	T3 n (%)	T4 n (%)	T3 n (%)	T4 n (%)
Pre-contemplation and Contemplation	1 (6.7)	0	2 (13.4)	0	1 (6.7)	0
Preparation	0	0	0	0	0	1 (6.7)
Action and Maintenance	14 (93.3)	15 (100)	13 (86.6)	15 (100)	14 (93.3)	14 (93.3)
Total	15 (100)	15 (100)	15 (100)	15 (100)	15 (100)	15 (100)

Weight Loss

Following the LCP, all participants were in the action or maintenance stage of change for losing weight, whereas at T3 one participant was in the contemplation stage, which can be explained as a relapse in stage of change (Table 4.19). Individual comparisons between T3 and T4 show that 11 participants remained in the same stage for weight loss following the LCP and four progressed towards psychological readiness to achieve weight loss (from action to maintenance stages) when comparing the distinct five stages of change.

Reducing Fat Intake

In their readiness to change fat intake, all participants were in the action or maintenance stage following the LCP compared to 86.6 percent at T3. There was a shift of two participants from the pre-contemplation or contemplation stage to the action or maintenance stage of change (Table 4.19). Individual comparisons show that ten participants remained in the same stage of change for reducing fat intake following the LCP, while five participants progressed in their readiness to reduce their fat intake (from preparation to action and action to maintenance stages), when looking at the distinct five stages of change.

Exercising

As at T3, the great majority of participants at T4 (93.3%) were in the action or maintenance combined stages of change (Table 4.19). One participant was in the contemplation stage, which again, can be explained as a relapse in stage of change. Individual appraisals of the five stages of change show that three participants remained in the same stage of change for exercise following the LCP, while 12 progressed in the psychological readiness to increase or maintain their exercise levels (demonstrated by changes from the action to maintenance stage of change).

Self-Efficacy

The average self-efficacy scores showed statistically significant changes between T3 and T4 (Paired sample t-test overall self-efficacy: $t(14) = -5.5, p < 0.001$). Motivation to adhere to healthy diet and physical activity improved following the lifestyle coaching. The overall self-efficacy scores at T4 were higher than that at T3 (59 compared to 54.2). The mean self-efficacy for nutrition (adhering to low salt, low fat foods and reducing portion size) increased from 28.6 to 30.6, and self-efficacy to adhere to exercise also increased from 25.6 to 28.4 at T4 (Table 4.20).

Table 4.20. Self-efficacy for nutrition, exercise and overall T3/T4

	T3 Mean (SD)	T4 Mean (SD)
Self-efficacy – Nutrition,* $p < 0.001$	28.6 (4.9)	30.6 (4.1)
A. Stick to your low fat, low salt foods.	3.73 (0.59)	4.13 (0.64)
B. Eat smaller portions	3.4 (0.98)	4.0 (0.96)
C. Eat lunch as your main meal of the day, rather than dinner.	2.47 (1.25)	2.80 (1.26)
D. Eat salads for lunch.	3.80 (1.08)	3.87 (0.99)
E. Eat low salt foods.	3.80 (1.01)	4.0 (0.65)
F. Eat vegetarian entrees for dinner.	3.13 (1.41)	3.27 (1.28)
G. Substitute low or non-fat milk for whole milk at dinner.	4.40 (1.06)	4.73 (0.59)
H. Cut down on gravies and cream sauce.	3.37 (0.74)	4.13 (0.83)
Self-efficacy – Exercise, $p < 0.001$	25.6 (4.5)	28.4 (5.4)
I. Get up early, even on weekends, to exercise.	2.87 (1.41)	3.53 (0.99)
J. Stick to your exercise program when you are tired or stressed.	3.40 (0.83)	3.6 (0.91)
K. Do a physical activity program of continuous activities for at least 30 minutes, 3 times per week.	4.0 (1.13)	4.47 (0.74)
L. Continue to exercise with others even though they seem too fast or too slow for you.	3.40 (1.06)	3.73 (1.03)
M. Stick to your exercise program when you have other family or household jobs to do.	2.87 (0.83)	3.13 (0.74)
N. Stick to your exercise program even when you have excessive demands at work.	2.80 (0.86)	2.87 (0.99)
O. Stick to your exercise program when social obligations are very time consuming.	2.93 (0.88)	3.33 (1.05)
P. Read or study less in order to exercise more.	3.3 (1.17)	3.73 (1.16)
Overall Self-efficacy,** $p < 0.001$	54.2 (7.3)	59.0 (6.6)

* adhering to low salt, low fat foods and reducing portion size

**Self-efficacy scores range from 16 to 80. The higher the score the more confident participants are to achieve healthy diet and exercise behaviours

Body Mass Index and Waist Measurements

For the group as a whole there was no significant change evident in the BMI between T3 and T4 ($z=-0.47$, $p= 0.64$). Whilst the BMI of eight participants decreased, one gained weight and one remained the same. There was a marginal non-significant reduction in mean waist measurements as a group at T4 (102.9cm, SD 6.4) compared to at T3 (103.3cm, SD 8.2) ($z= -0.09$, $p= 0.92$) (Table 4.21).

Table 4.21. BMI and waist measurements T3/T4

	T3	T4
BMI (kg/m²)		
Mean (SD) ($z=-0.47$, $p= 0.64$)	29.3 (2.6)	29.3 (1.89)
Median	29.0	29.1
Range	25.7-37.1	26.2-33.0
Waist Measurement		
Mean (SD) cm ($z= -0.09$, $p= 0.92$)	103.3(8.2)	102.9 (6.4)
Median (cm)	102	103
Range(cm)	90.5-122.0	89.0-110.0

Summary of the Impact of the LCP

In summary, the LCP had a small impact on the 15 participants' lifestyle habits overall, although it was noted that some individuals made important lifestyle improvements. Following its implementation, the consumption of alcohol was markedly reduced from a median of 6.8 to 4.8 standard drinks per week. Of the three participants who were smoking at T3, all quit during the program. There was a shift noted toward healthier dietary choices, with a reduction in the use of oils and butter and take away foods, and an increase in the intake of fruit and vegetables. Activity levels remained stable with all participants achieving sufficient activity per week. The hypothesis, that by delivering phase three of the intervention (LCP) participants would move from the preparation to the action stage of change, was met, as it was evident that there was a positive progression towards readiness to adopt or maintain behaviours related to weight, fat intake and exercise. The number of participants is too small for these changes to be statistically significant. However, statistically significant changes were noted in overall self-efficacy and self-efficacy related to nutrition and physical activity following the lifestyle coaching ($p < 0.001$).

4.4 The Overall Impact of the Intervention

The impact of the intervention at each phase was examined in previous sections. This section will illustrate the overall impact of the intervention using means as the average value as they are typically used in the literature and differences between outcome measures for individuals was generally normally distributed. Each cohort was examined individually to enable the phases to be evaluated for their impact on health outcomes and the Friedman's test was applied to the four time periods to confirm the group differences found in the previous section. There were 87 participants who participated at baseline, 57 participants commenced the second phase (education and commencement of the BMI competition), 44 participants who completed two phases of the intervention (education and completion of the BMI competition) and 15 participants who completed all three phases (education, BMI competition and the LCP). To explore the impact of all phases of the intervention delivered sequentially, the data collected from all four survey times as well as the monthly biophysical measurements, were examined together. The main focus of the intervention was to target nutrition, exercise and the psychological preparation required to make healthy lifestyle changes, although alcohol consumption and smoking were also considered.

Alcohol Consumption and Smoking

Self-reported alcohol consumption and cigarette smoking declined throughout the program. Although the majority of participants reported drinking alcohol at T1 (86.7%) and T4 (80.0%), there was a non-significant reduction in the mean number of standard drinks per week from eight at T1 to five at T4 in the LCP cohort (those who completed the three phases, $p= 0.13$) (Figure 4.13). At T1 there were 13.3 percent of participants smoking an average of 27.5 (SD 10.6) cigarettes per week. At T4 no participants reported smoking.

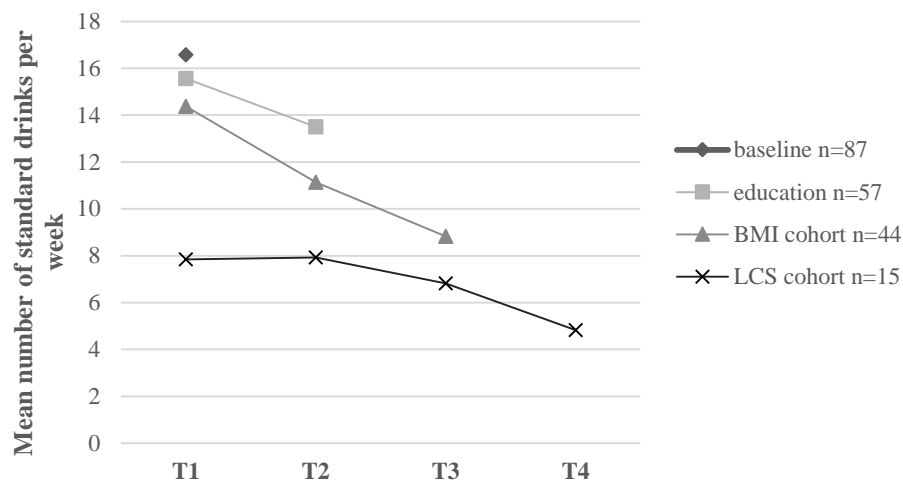


Figure 4.13. Mean alcohol standard drinks consumed by 4 cohorts at T1, T2, T3 and T4

Nutrition

The improvements to healthy dietary habits were statistically significant across all phases of the intervention. The greatest nutritional improvement trend was achieved by those who participated in all three phases of the project with the mean score for the FFB at T4 being 31.7 (SD 4.0) compared to 27.9 (SD 3.1) at T1 (Figure 4.14). The Friedman test also indicates that statistically significant differences occurred in nutritional intake across the four time intervals, $\chi^2 (3, N=15) = 17.83$ $p < 0.001$. The greatest nutritional improvement related to consuming more vegetables and reducing the need to cook with oil and use butter. The greatest regression was related to consuming wholemeal or wholegrain products.

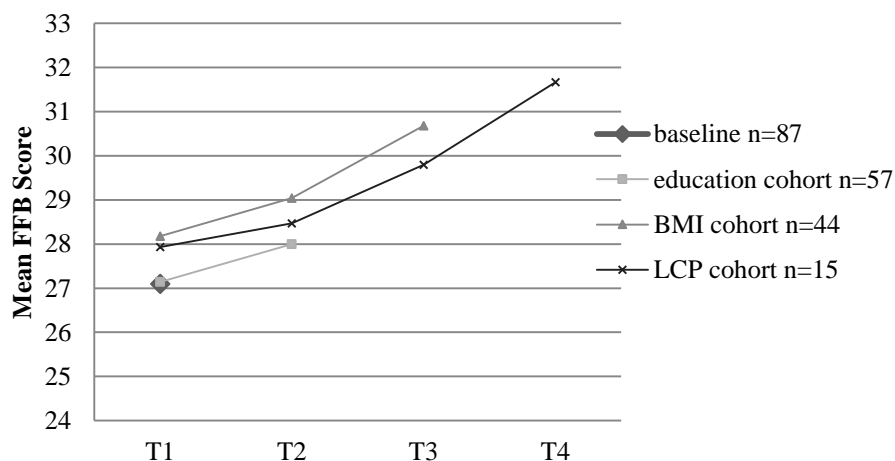


Figure 4.14. Mean Fat Fibre Barometer in by 4 cohorts at T1, T2, T3 and T4

Physical Activity

Three quarters of participants were achieving sufficient physical activity at baseline. This percentage rose across the intervention to 100 percent (n=15) at completion of the LCP (Figure 4.15 & 4.16). Although the majority of participants were achieving the recommended time exercising per week, participants who completed all phases of the intervention increased their mean total time exercising per week from 3.98 hours at T1 to 7.53 hours per week at T4 (Figure 4.16). The Friedman test also indicated that statistically significant differences occurred in physical activity levels across the intervention, $\chi^2 (3, n=15) = 12.72, p < 0.001$. Although numbers were small, the lifestyle coaching cohort plateaued in the amount of exercise that was conducted during the BMI competition, but had increased levels during the coaching program. The mean number of days and hours participants walked increased between T1 and T4 (3.36 to 4.33 days per week and 2.68 to 3.80 hours respectively). More participants reported conducting vigorous physical work (such as gardening, heavy work around the house) at T4 (60.0%) compared to T1 (46.7%). Although the mean number of days where this was performed remained the same (1.5 days per week), the mean duration increased between T1 and T4 (2.12 hours compared to 3.05 hours respectively). More participants also reported conducting other moderate physical activities as the intervention progressed: 46.7 percent at T4 compared to 30.8 percent at T1.

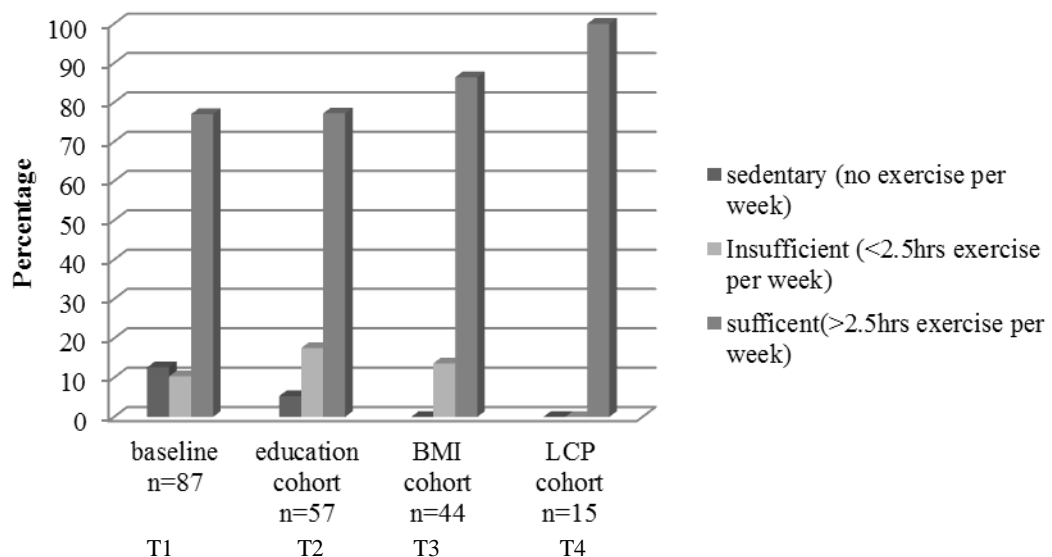


Figure 4.15. Sufficiency of activity levels by percentage over time for 4 cohorts

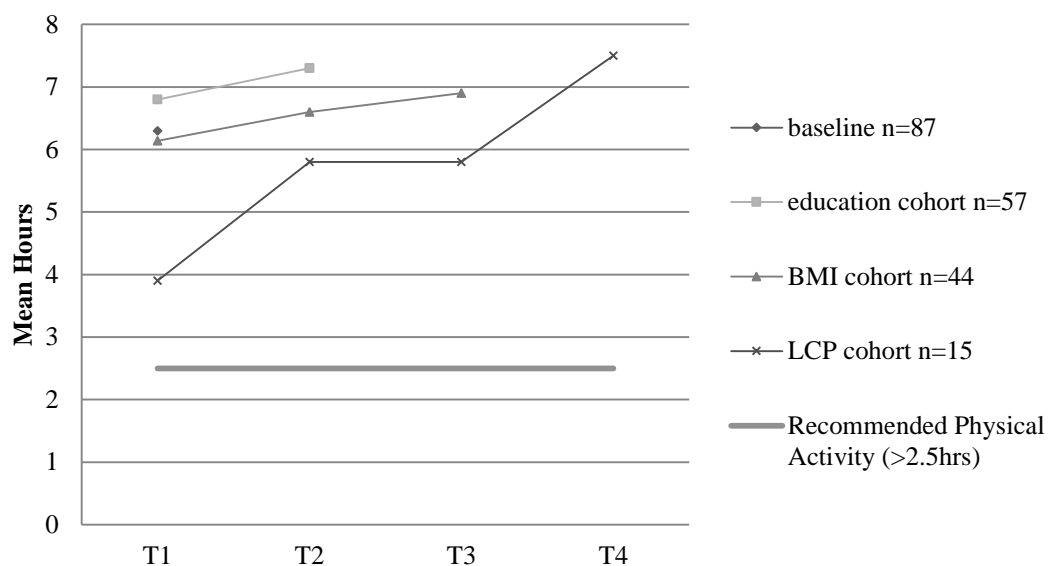


Figure 4.16. Change in time spent engaged in physical activity each week over time (walking, moderate and vigorous activity) by 4 cohorts

Stage of Change

Weight Loss

At baseline nearly half of participants (47%) were in the pre-contemplation or contemplation stage of change in their readiness to lose weight, whilst at the end of the intervention all participants were in the action or maintenance stage of change (Figure 4.17).

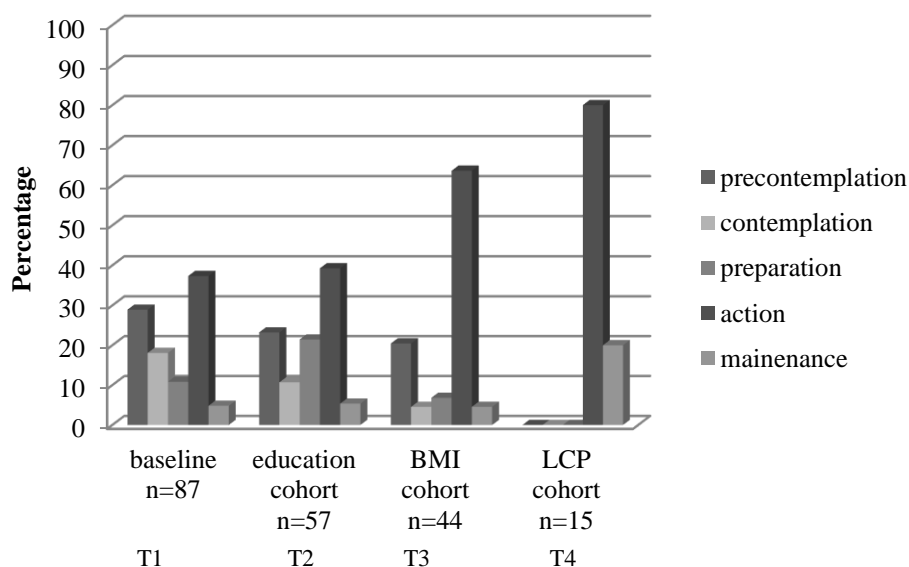


Figure 4.17. Percentage of participants at each stage of change - Weight loss over time by 4 cohorts

Reducing Fat Intake

In their readiness to reduce fat intake, there was a positive shift in participants from earlier stages of change to the action and maintenance stages of change across the intervention (Figure 4.18).

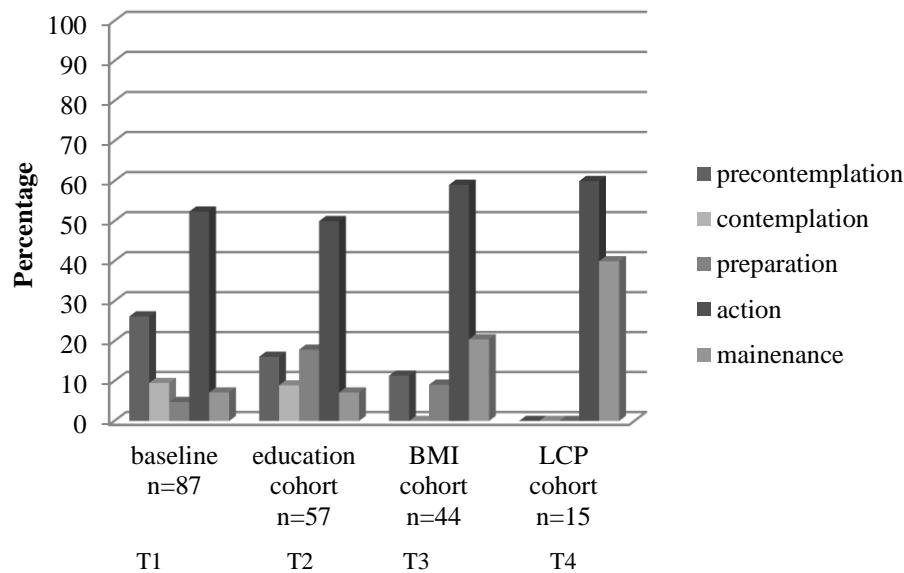


Figure 4.18. Percentage of participants at each stage of change - Fat intake over time by 4 cohorts

Exercising

There was a positive shift of participants from the action to the maintenance stage of change related to exercising. At baseline, approximately half of participants were already in the action stage and 12 percent in the maintenance stage of change for exercise, while at the end of the intervention 20 percent were in the action stage and 73 percent were in the maintenance stage of change (Figure 4.19).

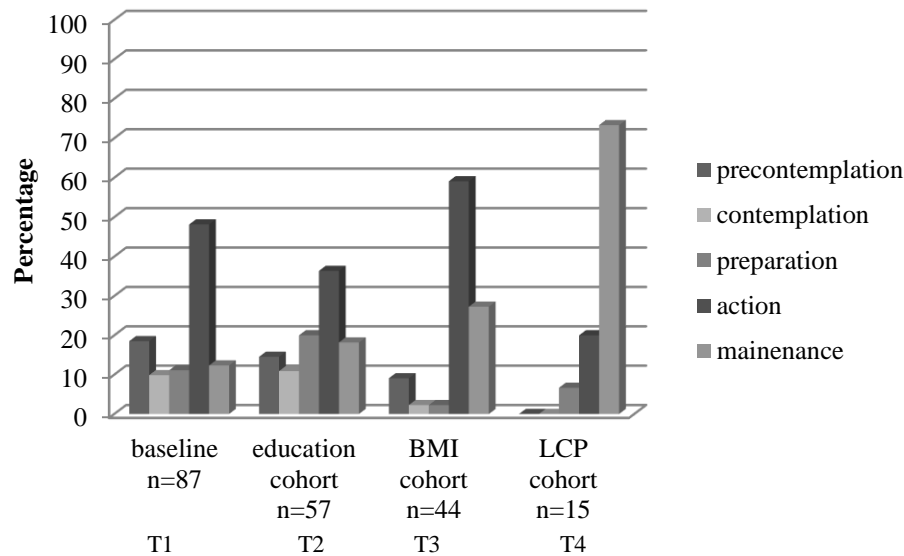


Figure 4.19. Percentage of participants at each stage of change - Exercising over time by 4 cohorts

Self-Efficacy

There was an increase in overall motivation for lifestyle change following all phases of the intervention. Whilst the overall mean self-efficacy score at T4 was only marginally higher than that at T1 (59.06 compared to 54.27) for the LCP cohort (Figure 4.19), the Friedman test indicated that statistically significant differences had occurred in overall self-efficacy levels across the intervention, $\chi^2 (3, n=15)=11.38, p= 0.01$. The mean self-efficacy for nutrition increased from 27.20 to 30.67 for participants who completed all phases, yet it remained at a similar level for participants in the education and BMI competition only. There was, however, a reduction in participants' self-efficacy in adhering to exercise which is demonstrated by the drop at T2 and T3. The self-efficacy related to exercise was regained during the LCP, which contributed to the overall score increase that is evident in Figure 4.20.

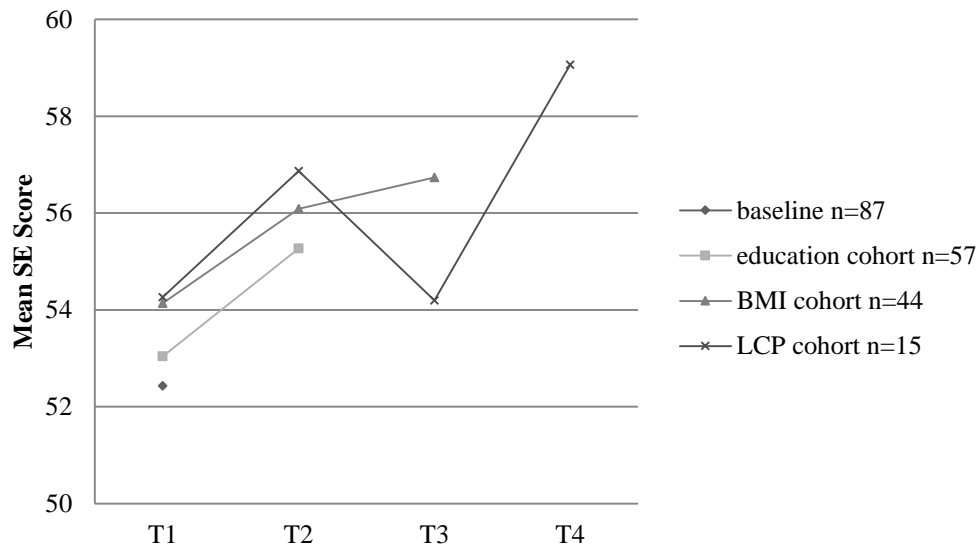


Figure 4.20. Mean self-efficacy total scores over time by 4 cohorts

Body Mass Index and Waist Measurements

There were small changes in the ‘right’ direction noted in the biophysical parameters of participants across the intervention. As depicted in Figure 4.21, there were consistent reductions in grouped BMI by organisations, with the exception of Organisations 2 and 3. Differences in the mean BMI of companies were evident with Organisation 5’s starting BMI of 32.5kg/m² being much higher than that of Organisation 6, which was 25.8kg/m². This is likely to be attributed to the variation in the type of primary work activity done by each company, with the roles in Organisation 5 being mainly sedentary such as machine operation, whilst those of Organisation 6 tended to be more active field work type roles.

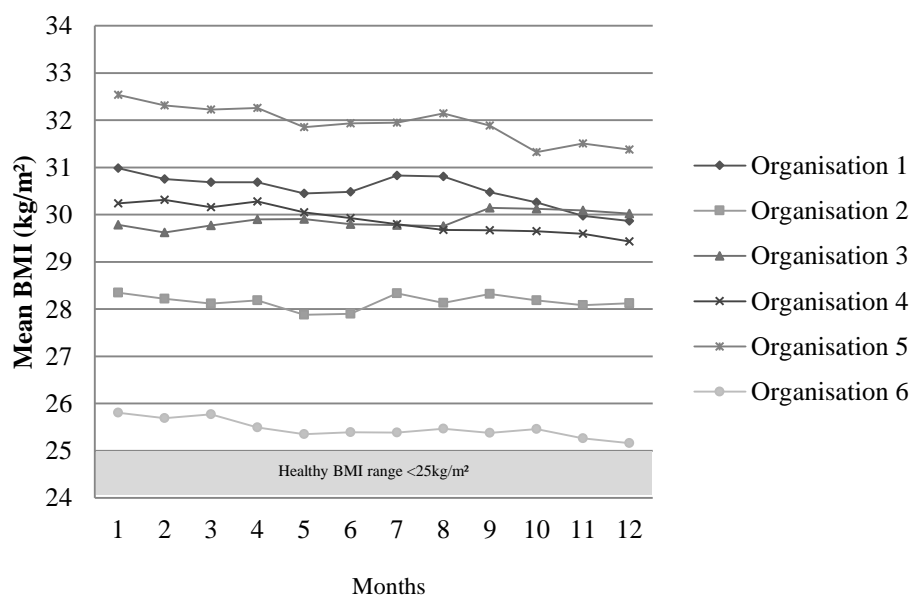


Figure 4.21. Change in mean BMI by organisation over 12 months

There was a total of 44 participants who completed the BMI competition (the full 12 months); of these 15 also completed the LCP while the remaining 29 did the BMI competition only. The results from a Friedman test indicate statistically significant differences in BMI for participants who completed all three phases of the intervention (education, BMI competition and LCP), $\chi^2 (11, n=15) = 37.19, p < 0.001$ and for those who completed two phases (education and BMI competition), $\chi^2 (11, n=29) = 27.97, p < 0.001$ (Figure 4.22). Although the changes were small, most were evident in the first six months of the BMI competition, with a weight gain evident between the sixth and eighth month, before a further downward trend in BMI.

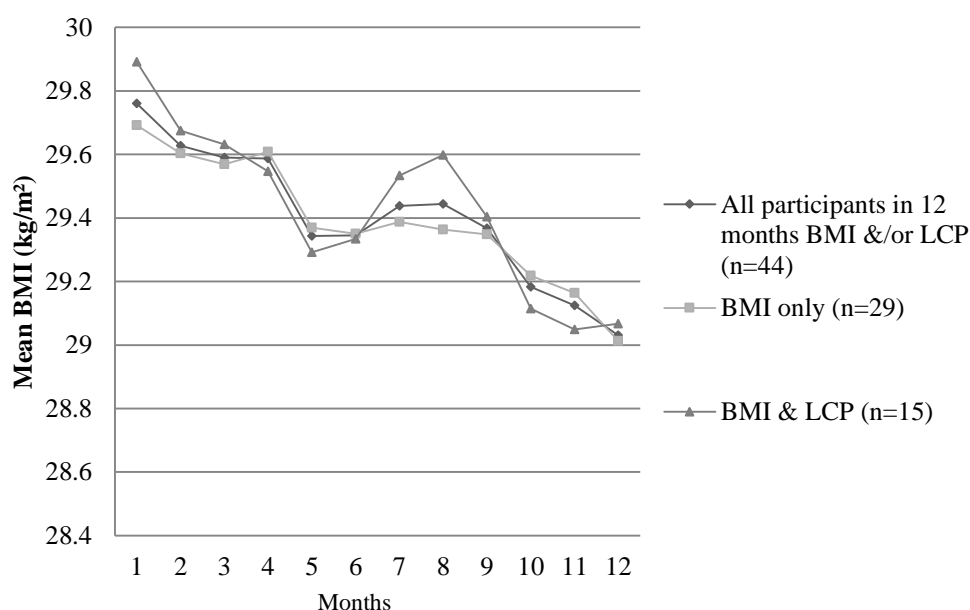


Figure 4.22. Change in BMI over time, with all participants (n=44), those completing BMI competition only (n=29) and those completing BMI competition and LCP (n=15)

The Friedman test also indicates that statistically significant differences occurred in waist circumference during the intervention, $\chi^2 (2, n=15) = 9.32, p < 0.001$. As with BMI the major changes were seen in the first six months of the BMI competition, followed by slower reduction in circumference in the second half of the program (Figure 4.23).

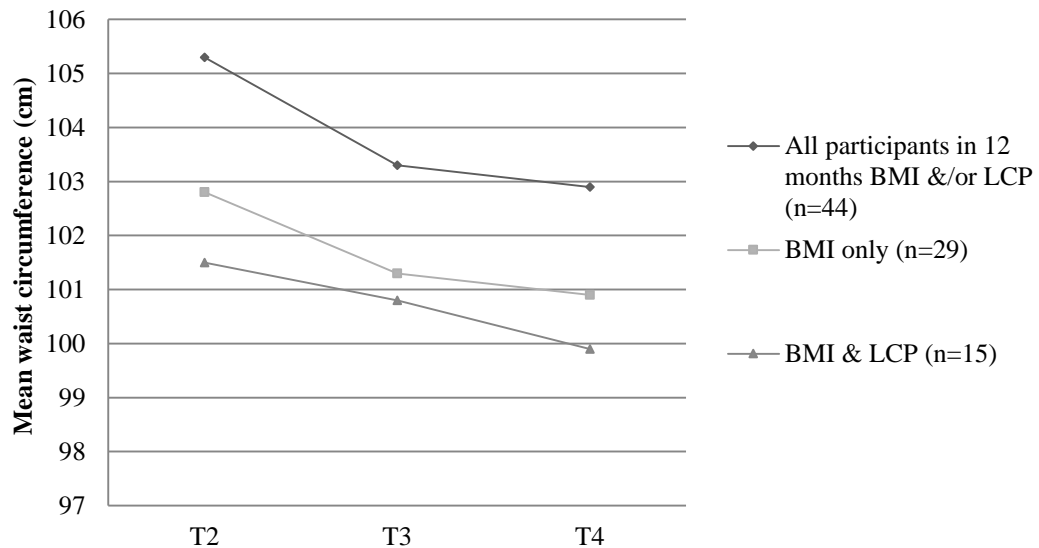


Figure 4.23. Waist circumference at commencement of BMI competition (T2), at 6 months (T3) and at 12 months (T4), with all participants, those completing BMI competition only and those completing BMI competition and LCP

4.5 Summary of the Quantitative Findings

The findings of *The Industry 'Waist' Disposal Project* show that this multiphase self-management intervention which targeted rural men in the forestry industry had varied impact on their adoption of healthy behaviours and on modifying some of the risk factors for chronic disease. A total of 87 men were reached by this project, and they received health education and support by participating in a self-management model that had not previously been trialled in their industries. The attrition rate across the phases was significant and perhaps reflects the highly transient, unpredictable nature of the forestry industry. It was evident that the intervention retained participants who were more likely to be older, work in white-collar occupations and married or in defacto relationships. The analysis of the data collected at each time point indicated that:

- Overall, the education sessions were well attended and changes to participants' psychological readiness to modify lifestyle behaviours to being healthier were likely, particularly for reducing fat intake.
- The BMI competition achieved some physical and psychological changes for participants. There were large statistically significant shifts from the preparation to action and maintenance stages of change, for both weight loss and exercise. Statistically significant changes in BMI and waist measurements were evident ($p < 0.001$) at the six month measurement of the BMI competition.

- The LCP shifted participants towards healthier dietary choices. Activity levels were maintained at sufficient levels and there was a positive progression towards readiness to adopt or maintain healthier behaviours related to weight, fat intake and exercise.

This chapter has presented data related to the project's four established hypotheses. Hypotheses one to three were generally supported namely;

1. by delivering phase one of the intervention (education presentations), most participants would progress from the pre-contemplation stage to the contemplation stage of change; that is, they would be actively contemplating lifestyle change;
2. by delivering phase two of the intervention (the BMI Competition), most participants would progress from the contemplation to the preparation stage of change; and
3. by delivering phase three of the intervention (the LCP), most participants would progress from the preparation to the action stage of change.

In particular, the education, BMI competition and LCP were individually successful at motivating participants to implement lifestyle change, with a positive shift towards action and maintenance stage of change for all measures.

The final (fourth) hypothesis, namely that *The 'Waist' Disposal Model* of self-management will be successful at moving men through the stages of behaviour change, was generally supported by the data in this study. It was evident that the multiphase intervention was able to move men successfully through the stages of behaviour change, at least to some extent. The relatively small sample size made it difficult to accurately assess whether statistical significance for some measures were present. The study confirmed that the intervention was effective at targeting the key outcomes of healthy diet, exercise and ultimately a reduction in BMI, for men working in rural areas.

The next chapter presents the qualitative findings, exploring in more depth the appropriateness of each phase of the intervention. It also examines the attitudes of men towards lifestyle change and what factors contributed to or hindered them moving to the next stage of change, particularly in relation to nutrition and physical activity.

Chapter Five

Qualitative Findings

5.1 Introduction

This chapter presents the qualitative findings of data collected from semi-structured interviews with 21 men working in the forestry industry in rural WA. The aim of this study was to explore the feasibility of implementing a self-management initiative to a worksite in regional WA. Qualitative data were collected to provide a picture of the experience of participants involved in the program and to explore factors associated with healthier lifestyle adoption for men in rural WA. The inclusion criteria for this phase of the program were: 1) being an English-speaking forestry worker; and 2) being involved in, or being aware of, *The 'Waist' Disposal Program* in the workplace. The inclusion of between 15-25 participants was aimed at prior to commencement of the study. The demographic characteristics of the sample and setting are described, followed by an in-depth presentation of the qualitative findings. The central theme *My Health: My Choice* that emerged from the data will be explained in this chapter, as well as the four associated subthemes, *Identified Barriers*, *Identified Motivators*, *Identified Supports*, and *Experience with The 'Waist' Disposal Program*. Each theme will be explored in depth and supported by example quotes from the men interviewed in this study.

5.2 Demographic Characteristics

Participants were purposely selected based on their experience with the program, which phase of the program they participated in and/or defined characteristics including age, marital status, type of occupation and their self-reported stage of change at the time of their interview. The variation in the sample served to provide a diverse view of the participant's experience with *The 'Waist' Disposal Program*. To explore reasons for non-participation, two men who were aware of, but chose not to participate in, the program were also interviewed. A total of 21 participants were interviewed (Table 5.1). The median age of participants was 49.5 years with the youngest being 26 and the oldest 61 years. The majority of interviewed participants were recruited from blue-collar occupations such as those who operate forestry machinery, e.g., loggers, chippers, skidders and trucks (n=17, 81%) and were married (n=12, 58%) or living in defacto relationships (n=5, 24%). The majority of participants were in the overweight (52.5%) or obese category (28.3%), despite 43 percent being in the self-reported action stage of change at their interview.

For participant convenience, the interviews occurred face-to-face (n=11) or by telephone (n=10). The median duration of interviews was 30 minutes (minimum=12, maximum=56). The shorter interviews reflected minimal, or lack of participation in the program, though all participants still responded to the open ended questions. Data saturation became evident after 18 interviews, however to verify emerging themes 21 interviews were conducted.

Table 5.1. Characteristics of the qualitative sample

Characteristics	Number (%) (n=21)
Age in years	
Mean (SD)	46.0(10.2)
Median (range)	49.5 (26-61)
Marital status	
Single	3(14)
Defacto	5(24)
Married	12(57)
Separated/ Divorced	1(5)
Occupation	
Blue-collar	17(81)
White-collar	4(19)
Experience with the program	
Non-participants	2(9)
Phase one	1(5)
Phase one and two	10(52)
Phase one, two and three	8(38)
BMI category	
Healthy weight (18.5-24.9 kg/m ²)	2 (9)
Overweight (25-29.9 kg/m ²)	11(53)
Obese (30-34.9 kg/m ²)	6(29)
Severely obese (≥ 35 kg/m ²)	2(9)
Stage of change for weight loss	
Pre-contemplation	1(5)
Contemplation	2(10)
Preparation	4(19)
Action	9(43)
Maintenance	5(23)

5.3 Themes

The central theme that emerged from the data was that of *My health: My choice*. This central theme describes the core concept of how men involved in this study viewed their health and in particular their weight, irrespective of their stage of change. It incorporates four sub-themes that are interlinked to explain the complex interplay of factors associated with achieving and maintaining a healthy lifestyle for rural men working in the forestry organisations who were involved in this project. The four subthemes are; *Identified Barriers*, *Identified Motivators*, *Identified Supports*, and *Experience with The 'Waist' Disposal Program*. The diagrammatic relationship between the themes is represented in the conceptual model in Figure 5.1. As depicted in this diagram the sub-themes are not mutually exclusive; rather, many of them overlap as they are perceived in different contexts.

5.3.1 My Health: My Choice

My Health: My Choice emerged as the central theme as participants discussed their health, lifestyles and issues related to diet and exercise. Irrespective of the participant's self-reported stage of change, the men involved in this study were clear that it was their individual choice whether they made changes to their lifestyle, which is supported by the statement "*at the end of the day, it's up to me*" (P7). They highlighted that lifestyle behaviour changes and losing weight were "long-term things" and that resisting change was common for many men. Men described having many relapses in unhealthy behaviour before reaching their goals. One man said:

Because it's a long-term life style change and what's happened in the past with me [is that] I'll do it and I'll do it and then I'll slip into old habits again, and then I'll go back and I'll lose the weight and then I slip into old habits again. (P3)

Participants discussed the catalysts for change. The majority of participants involved in this study did not have a diagnosis of disease, were asymptomatic of major illness and reportedly had not been warned about their level of risk for illness. Therefore a "health scare" was only described as a reason for changing habits in a couple of participants. For most it was the identification of a perceived need to make changes in their life. Others described their doctors as key people who might suggest changes and enable them to adopt healthier lifestyles. One participant said:

I think it was just the fact that one day I had enough of this and decided I wanted to do something about it. You know it's a funny thing; I can't really put my finger on anything. I mean my doctor told me I had to, actually that was probably it. (P4)

There was an acknowledgement by the majority of men that health initiatives would only be successful for those already in a state of readiness to make changes. One participant said:

You can only change things if those people want to make the change. (P16)

Participants further acknowledged that people needed to take responsibility for their own health; however this was dependent on individual perceptions of the need to make these changes. One man in the pre-contemplation stage expressed that health was his own responsibility:

I think it's just the awareness of their own predicament really. I mean, it's like smoking or any sort of any unhealthy habit....You've got to want to be healthy. You want to be aware of your body within yourself [and] it's a pretty hard thing. (P19)

There was a general awareness by participants that there were key differences between men and women. A couple of participants made jokes related to women generally living longer than men, but overall participants commented that men were less likely to discuss their health issues and would delay seeking help from health professionals until it was unavoidable. Stoicism was demonstrated by most of the men. Typically they did not routinely visit the doctor and several participants stated that they would only see a doctor when “*something was really wrong*” (P10) or when they presented to an emergency department.

Blokes just don't go to the doctor and spill their guts so to speak. I don't know, I suppose to be honest it's probably just a male thing of being deemed as being, not necessarily weak, but you know blokes like to think they can deal with things themselves. (P13)

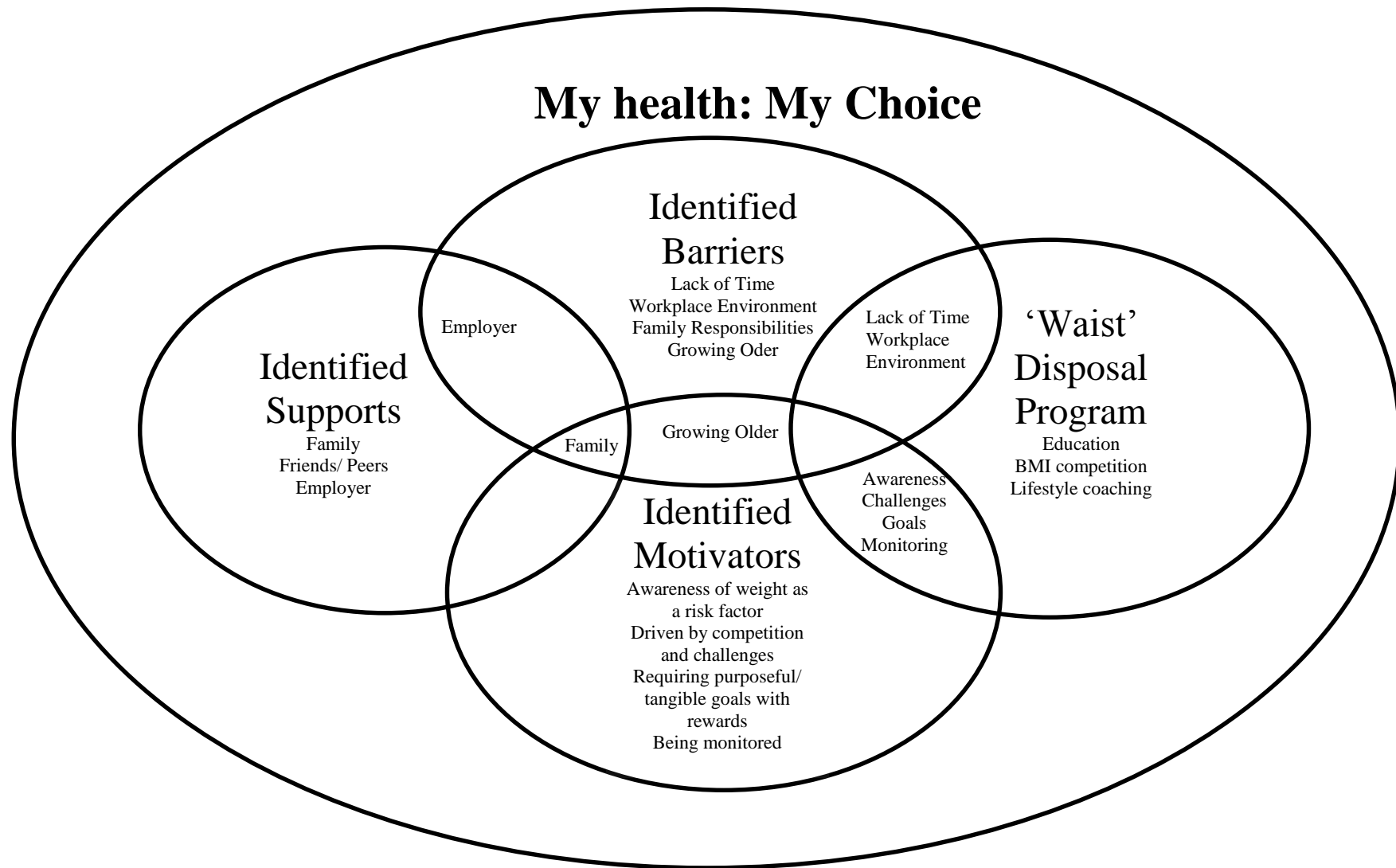


Figure 5.1. Conceptual model of key qualitative findings

This central theme describes how men generally portray a sense of stoicism and highlights that they must have a clearly defined need to make lifestyle changes. It was portrayed that those men in later stages of change (namely action and maintenance) were more willing to adopt strategies that facilitate change. Within this theme are four interlinked subthemes, which all play a part in facilitating the adoption of healthy lifestyle choices (Figure 5.1). These subthemes will be discussed further in the section that follows.

5.3.1.1 Identified Barriers

As participants discussed their health, they acknowledged a myriad of factors that were perceived to hinder their adoption of healthy behaviours. These factors were grouped to form the subtheme *Identified Barriers*. There were a total of four categories that were identified as key barriers to a healthier lifestyle, namely: *Lack of Time*; *Workplace Environment*; *Family Responsibilities*; and *Growing Older*. Participants who were in earlier stages of change, did not participate in the program, or else completed only phase one of the study, identified more barriers and reported that they considered the barriers too significant to overcome to make changes to their lifestyle.

Lack of Time was considered the greatest barrier to achieving a healthy lifestyle for these forestry workers. This category also directly links with the *Work Environment* category, as the lack of time was considered to be associated with the long working hours typifying the forestry work setting. Participants described working between 10 and 14 hours per day, with particularly early morning starts. With these long working hours, men described having little time in their day outside of work, eating and sleep. This was particularly illustrated by participants who were in the pre-contemplation/ contemplation stage of change and/or those who didn't participate in the program. A participant who was in the pre-contemplation stage of change said:

Well, first of all time is always a bit of a problem when you are doing anywhere from 12 to 14, 15 hour days you don't have a lot of time. By the time you finish work, get home have tea, have a shower, it's time to go to bed. Then you are usually up, you know anywhere around 3 or 4 o'clock to get ready to go to work. So time is a big problem. (P19)

The lack of time outside of work was seen as a barrier to all aspects of achieving a healthy lifestyle, particularly exercising. Participants in the action and maintenance stages of change identified the long hours at work as a barrier, but found ways to overcome this such as completing work activities on foot rather than driving, when possible, or scheduling to exercise

sometime after work. Participants described finding time to exercise as extremely difficult, as they often left for work in the dark and arrived home in the dark. Furthermore, and as a consequence of the long working hours, men described being constantly sleep deprived and feeling too tired to exercise and eat well. One participant in the maintenance stage of change said:

Most weeks you know there is no time in the day, you are just sort of tired and that's a bad recipe because when your body is tired you want to eat more... I mean you work a fairly active role but it's not huff and puff exercise either, so it's just a bad combination I suppose. (P13)

All participants described the **Working Environment** of the forestry sector as being a major challenge in the adoption and maintenance of healthy behaviours. The organisations involved in this study provided a diverse range of forestry related services, which was reflected in participants' comments that the forestry industry was complex and typically employed a large variation of employees in diverse roles. Men highlighted an often high turnover of staff and working conditions that were a deterrent to making changes for some. Most of the men interviewed were involved in field based duties, travelling vast distances and seldom spent much time at the base or office. These industry specific factors illustrated the complexities of targeting this workforce, and men commented on how delivering any type of program was difficult. One man said:

Forestry has got a few different aspects to it and you know there is a lot of machine hours...it's an industry that's always had problems with communication. It's a fantastic industry for the environment [and] for the economy and it's really complex. And there are a lot of really smart people working in it but it employs a really broad spectrum of people. So you've got those sorts of complex issues. (P11)

The long working hours were a key issue, but other issues such as the sedentary work, lack of scheduled breaks, productivity type bonuses causing reduced incentives to take breaks, and occupational health and safety issues, were described as impacting on the participants' health. In general, participants described the forestry industry as having primarily sedentary work activities. The move towards machine operation and efficacy was highlighted as men described the work being mainly 'machine or truck driven' for extended periods of time.

We are sitting in a machine 10 to 12 hours a day, you know it's like driving to [city] and back 3 or 4 times you know. You are too tired to do anything afterwards you know. (P7)

Furthermore the long working hours and isolated working environment meant that many of the men described unusual and/or erratic eating patterns and choosing food that is easy to consume while still operating a machine or truck. Participants who were in the earlier stages of change described frequently purchasing “roadhouse” food, because it was perceived to be too difficult to prepare suitable meals to eat at work. Those participants in later stages of change described mostly preparing their own food to take to work, however there were problems with this as a participant who was in the action stage of change explained:

Some days, quite often I do 12 hour days so you take a little bit, you might take an extra sandwich or you will take a little hot pack of whatever you had for tea last night as well. Because you think “Oh well I might be stuck out in the bush” and then because you’ve got it, you end up eating it and you probably shouldn’t. Because then you come home you’ve eaten your lunch at 4 o’clock and you come home at 6 o’clock and have tea. (P6)

There was a heightened awareness of the types of foods they consumed at work in those participants in later stages of change. One participant in the maintenance stage of change said:

You eat the wrong things. You eat the easy things. [Forestry] is not really set up to try and lose weight. You are set up to eat a big breakfast and a big lunch and big tea, not little and often like they recommend...and see the problem with healthy food is it's expensive. And it's not easy, it's not stuff you grab off the shelf and throw in your bag and eat it on the run. There is not a lot of choice of healthy foods that are on the run type foods. (P13)

Many participants described being on productivity type bonuses, which encouraged participants to work long hours and take fewer breaks. Breaks were only taken when there was a halt in productivity, for example trucks being unavailable for filling with woodchips. One participant said:

In our environment there are some financial constraints...guys tend to work when there are trucks lined up to fill and if they are not, they have a

little break. We don't have the structured work place so that makes it difficult. (P8)

During breaks participants described being restricted by the occupational health and safety requirements of the worksite. Consequently, they spoke of being limited to certain areas and in some cases required to stay in their machines or trucks, which therefore prevented them from exercising in their breaks. Those in earlier stages of change indicated that there was no way of exercising at work. Conversely, for others in later stages of change and those who had proceeded through the phases of the program identified opportunities such as walking around their truck or walking in the field. Although the forestry industry is not unique in its working conditions, participants did note that it is dissimilar to many other industries in that there are limited benefits such as those offered at mine sites with prepared meals, access to gyms, pools etc. One participant said:

Up north, mines and all that have got gyms and stuff like that you can use on site. (P7)

For some of the men, part of their role included fighting fires over the summer period. This responsibility was clearly taken seriously by the men interviewed in this study. They described how there was an expectation that they were fit for fighting fires and were required to complete an annual medical check and also pass a fitness test. It was highlighted that despite the expectation that employees meet these fitness requirements, there was little done in the way of offering support or aiding employees to achieve this. One participant said:

My belief is [that] if they expect you to be fit for firefighting then they need to provide you with some kind of training. (P3)

Family Responsibilities were also described by participants as being a barrier to adopting healthy lifestyles, with many of the men involved in this study describing the struggle of trying to meet all their family and social needs. Although families, particularly for men in the action and maintenance stage of change, were also seen as a motivator to make changes towards healthier living (which will be explored later), the responsibilities associated with being a husband and a parent meant that men often felt that they didn't have time to exercise. One participant said:

Instead of going for a walk around the block, I've got to take them there or do this or that. (P9)

Men who were in the action and maintenance stages of change further mentioned that families were sometimes a barrier when they were the only member trying to make healthy changes.

It's just harder like when I'm trying to change my diet and everything like that but she's still buying goodies for them and the kids. And its temptation, it's there for me to take. (P7)

Growing Older emerged as a category because men described an increase in weight and reduced exercise as a direct consequence of getting older. There was an acknowledgement by the more mature men in this study that maintaining their weight had become increasingly difficult as they got older. This contrasted with the younger men involved in this study, who felt that, while they were young, they could eat and drink anything, not have to exercise and that their weight would remain constant. In general, age was described as a key barrier to a healthy weight. One participant in the maintenance stage of change said:

I remember when I was not a lot younger back when I was probably 22 or something. You know I would have lived on hamburgers and chips for lunch and pies and beers and coke for smoko. But my metabolism was a lot different then and you know I was fit and healthy and probably only weighed 85 kilos or something... [I got] away with it but as you get older your metabolism changes and you start to put the weight on. (P13)

Regardless of their stage of change, many men further described using their age as an excuse for not adopting healthy lifestyles. In particular the physical changes associated with getting older were seen as a restrictor to exercise. Another man in the maintenance stage of change said:

When I get going I'm pretty good... as you get older it becomes harder though. I find my knees for instance, you just become too old for it. (P5)

5.3.1.2 Identified Motivators

The sub-theme *Identified motivators* arose as men discussed influencing factors on the decision to initiate, adopt, and maintain healthier lifestyles. It was suggested that men in later stages of change identified a greater number of motivators and were clear about what

encouraged them to change. Those in pre-contemplation and contemplation stages of change found it difficult to clearly identify what would motivate them to make healthy changes. The factors that were identified were broad ranging and narrowed to five key categories, namely: *Awareness of Weight as a Risk Factor; Driven by Challenges and Competition; Encouraged by Family; Requiring Purposeful, Tangible Goals with Rewards; and Being Monitored and Answerable to Someone.*

Increased Awareness of Weight as a Risk Factor emerged as a subtheme of *Identified Motivators*. Although many of the men were overweight or obese, most reported that they had not perceived their weight to be a major problem. Being labelled as “overweight” or “obese” and to formally receive a BMI category was reported to create an awareness of the issue. Once aware of the issue, men described being motivated to “kick start” changes to their lifestyle. Although some men were already aware of the changes in their body and the need to make some lifestyle changes or adaptations, most acknowledged that they were just not aware of the extent of their weight issue. Interestingly, men compared themselves to others to assess their weight and need for change. Those men in the pre-contemplation and contemplation stages of change spoke of perceiving themselves as being lighter and healthier than others in their workplace. One man who was in the overweight category and pre-contemplation stage of change said:

I thought [that in] the scale of workers that we had working for us, I'm probably one of the little fellows. (P19)

As a consequence of making overly optimistic self-comparisons with others, there was a delay in participants acknowledging their weight as an issue, and a resultant delay in changing their stages of change. Although participants appeared to understand the consequences of a poor lifestyle and being overweight, in general their understanding was superficial and in itself not always a sufficient motivator for lifestyle or behavioural change. Typically, men commented that gaining an awareness of their health and recognising weight as a priority only came about as changes were recognised or noticed in their bodies. Although age was seen as a reason for some of these physical changes, they were described by some men in the later stages of change as a motivator to do something about physical changes. One participant in the action stage of change said:

Basically you get a bit older and you start becoming a little bit more aware of your, you know, of your physique, and when you get out of bed in the

morning you barely can't reach... You start to think "What am I doing here?" (P18)

Men emphasised that they were ***Driven by Competition and Challenges*** in their lives. They were interested in competition at work and socially. Men discussed how their work was competitive with trying to meet their daily logging or chipping quotas, or beating other forestry teams to achieve these quotas. Having a challenge or competition, such as the '*Waist*' *Disposal Program*, which was related to health was seen as a key motivator to achieve changes.

So I would say to you that it is the motivation of someone else challenging you, and I would say that for most men. (P2)

Men were particularly competitive when it came to the topic of exercise. Several participants described how exercising with others motivated them. One participant in the action stage of change said:

It's that competitive thing men need to be challenged. If you've got someone else to exercise with you will always push yourself harder. (P2)

Collegial camaraderie and the competitive nature of the forestry workforce were highlighted by participants in their discussion of motivating factors. Men described joking with other men about health. It was highlighted that they were reluctant to engage in serious conversations about health; rather they took a jovial approach. This was perceived to be supportive and aiding the goal of achieving healthy lifestyle changes.

It's just the way it kind of happens, you know, in a male dominated work place... If you need to sit down and have a good chat with someone about what's going on then yeah, that happens. But most of the time you are sort of working a humour angle or a peer pressure kind of thing. It's more of a team work kind of thing rather than peer pressure ... You know your mates are giving you [expletive] about being fat ... you don't need to sit down with a bloke and go "Oh look you know, you should really probably have a salad instead of a pie". (P11)

Although participants viewed their witticisms as being motivators, some participants described being aware of not going too far with their jokes and that they had to be careful that they were not bullying their peers. One participant said:

It's probably not in all work places, it's probably not amongst all workers. I get away with it because that's my nature and everyone know that I'm pretty harmless... Unfortunately, a lot of that is bordering on bullying nowadays and you do have to be a bit careful about calling someone a fat [expletive]. (P16)

Despite the bantering being perceived as a stimulus for change for most, one participant who was in the contemplation stage of change expressed that he found it to be counterproductive:

I suppose everyone always tells me I'm overweight. It always [expletive] me off a bit, I know it should motivate me, but no, it [expletive] me off. (P21)

Men described being **Encouraged by Family** to improve their health. Although at times families were perceived to be a barrier for adopting healthy changes, on the whole men mentioned wanting to be active fathers and being around for a long time to see their children and grandchildren grow up.

It was actually my mum that was concerned about me, you know, she didn't want to lose me. She said "You've got a lot of weight around your heart"... Also, motivating me is probably the kids and that. I knew if I kept putting on weight I would be leading towards a heart attack or something like that. And then I've got four kids to raise and look after, so that was sort of my motivation. (P7)

Men also described how they were encouraged to change to be role models for their children. One man said:

Okay, a couple of reasons why I did it...I've got a teenage daughter, well she's actually 15 [and] she's a little bit overweight. And my wife is overweight as well, a little bit overweight. So, one of the biggest things I kept sort of saying to my wife and my daughter "Watch what you eat and do and all this sort of stuff". And she kept saying to me "You have to do it and lead by example", and it sort of eventually was the trigger and I said "Well, well I'll do that". (P5)

Some participants mentioned being aware of the familial link with health and commented on how their poor family medical history was considered a motivator to change in order to prevent their own future ill health. One participant aged in his early forties mentioned medical concerns throughout his family:

I used to be a smoker years ago as well, and I've got a pretty bad family history. My father died when he was 48 from a heart attack or heart related [illness]. My mum has got diabetes, my nan had diabetes, you know my dad's brother died when he was 48. So when I go to the doctor he just keeps reinforcing that "You know you are in the same category with carrying extra weight and bad family history". So you need to start un-ticking some of the boxes, so it's always been on my mind anyway. (P13)

Men in relationships described their partners as being instrumental in achieving health related goals. They were seen as the key people with whom they could discuss health matters and who encouraged them to change their unhealthy habits. Similarly, those participants without partners portrayed a sense that a partner would be a motivating factor towards aiming at a healthier life. Although some men joked about looking good for their partners, the main focus was that they were encouraged by having someone to achieve it with.

My wife would be a big key part of motivating me to lose weight. I do talk to her about things; some things, surprisingly I don't. You know like those medical personal things, I don't come out straight up. She's not overweight, she's only 64 kilos now [and] she's being going through her own weight loss and getting fit program. So yeah she is probably a key motivator I guess without my wife active in doing that, it would make it a lot harder too. (P13)

Men interviewed in this study described ***Requiring Purposeful, Tangible Goals with Rewards***. Generally, they described that they were compelled by seeing that there was a task that could be completed and that they would be rewarded for achieving this. Interestingly, the concept of 'improving health' appeared too broad for most men in this study. They needed more tangible targets and although the concept of weight loss was more concrete, they described needing more specific tasks that they could focus on. Furthermore, for many of the men such tasks needed to be purposeful. For example, several men implied that exercising for the sake of exercising was senseless. They were happy to exercise if they could also achieve

something more tangible; hence building exercise into the workplace was described as appealing. One participant in the maintenance stage of change said:

I can't see the point, and I think it's probably generic to a lot of guys,... the idea of pointless exercise; walking around the block for no purpose other than exercising. That's why I really like the idea of building it into work. There is a reason and you build it in so that half hour is not a wasted half hour or whatever, it is it's something you have to do. And then putting on, you know, shorts and something like sandshoes and walking around the block for half an hour is, well, certainly not for me. I have done it but I don't do it regularly because it's just not appealing at all. (P9)

Appearance was not identified as a motivator for men in this study. Although some referred to “their protruding stomach” and made jovial comments that being overweight was not that appealing, primarily men in the earlier stages of change did not see it as a reason to change their behaviours. One participant in the contemplation stage of change said:

Looking in the mirror and not having a rather protruding stomach. You know it would be nice to be ultra-lean stuff but I'm just not being able to as I'm getting older, you know I'm 36 now. (P3)

In addition to wanting purposeful goals, men described being motivated by rewards for their behaviour change. Generally participants in the later stages of change referred to more internal rewards such as feeling better, seeing changes in weight, and being better at their sport of choice. In contrast, those in earlier stages made reference to being motivated by financial reward and a couple made suggestion about their employer paying them to exercise. However, one participant in the action stage of change said:

I think one of the best motivators is actually losing weight. (P4)

Participants indicated that ***Being Monitored and Answerable to Someone*** with regard to their health was a strong motivator to achieve changes. Participants expressed how the regular contact and monitoring provided in The ‘Waist’ Disposal Program was key to maintaining their motivation to adopt healthy behaviours. They described how the motivation to change behaviours waned quickly, and having someone checking on their progress enabled motivation to be sustained.

Knowing that someone is going to come back and put down what weight you are....is a challenge. And I think that's a very good thing, because it gives you something to aim for. When it's a long period of time one can get away from one's self. And one knows it [the weigh-in] is coming up so you go really hard. (P2)

Interestingly a couple of men described “targeted nagging” as a way to sustain the motivation for adopting healthy lifestyles. One participant said:

Constant nagging does count for something. As long as it's targeted, you know,... in regards to one topic. You can't just go out nagging for [expletive] everything. (P11)

5.3.1.3 Identified Supports

Identified Supports emerged as a subtheme to achieving a healthy lifestyle, as men described what they perceived to be the key forms of support in their lives. These supports were different from what motivated men to adopt healthy behaviour changes and instead focused on what men felt that they needed to maintain these changes. Men in the action and maintenance stages of change provided rich descriptions of their supports and were clear about what was required for them to maintain changes. Three categories were identified: *Support of Family*, *Support of Friends and Peers*; and *Support of their Employer*.

For men across all stages of change, *Support of Family* was considered an important form of support for the sustainability of healthy behaviours. As well as being a key motivator to change, families were considered instrumental in the facilitation of changes. Partners were described by the men as having significant control over their diets, as they commonly did the shopping and cooking of meals. Men further described feeling more confident to make changes if their wives were also trying to lose weight.

Because if you are not supporting each other, then someone is going to lapse. (P15)

Children were also perceived to aid men by encouraging them to be active. Men spoke of often feeling too tired to exercise, but that children would ‘make’ them get outside and play with them.

Support of Friends and Peers emerged as a subtle form of help for men in this study. They did not define their friends or work colleagues explicitly as key supports, but did identify that they helped them to achieve healthy changes. Friends were seen to be particularly helpful regarding exercise. Several of the men described not wanting to exercise by themselves but enjoying exercising with friends and found that they were encouraged by having their friends to exercise together.

I'm not motivated enough to get out there in the cold and do it. If I had a friend who said "Come on we're going" I probably would be. So, um yeah, I don't know... I don't like to do things by myself. (P16)

Support of Employer emerged as a form of support. Although the workplace was primarily seen as a barrier to healthy lifestyles for men in this study, there were aspects of their employment that were perceived to provide support. This was mainly described by men in the action and maintenance stages of change. Some participants commented that their workplaces were as proactive as they could be and that they encouraged workers to look after themselves. One participant in the action stage of change said:

But conversely [company] has an expectation that their staff do look after themselves, which I found was quite refreshing. (P4)

Some participants described receiving support by their employers to aid in their lifestyle changes. One participant in the action stage of change spoke of being in receipt of a gym membership from their employer.

Well, I thought you might have been whispering in [employer's] ear because he got me the gym membership and you turned up with this weight loss program.... (P6)

Participants felt that their work productivity would increase because they were supported and valued by their employers and therefore their companies would benefit financially. One participant said:

But that was just a bonus having you come along... I thought "This is great, the company want to do something about it and we've got someone else coming in who wants to help the company do something about it..." I think if more companies did something about their workers, the productivity from the workers would actually be better. (P6)

5.3.1.4 Experience with The 'Waist' Disposal Program

The 'Waist' Disposal Program was viewed by all interviewed participants, including those who chose not to be involved in the actual program, in a largely positive light. Overall, men in later stages of change described the program as being more effective in assisting them to make healthy change than those men in the earlier stages of change. It was perceived as a great program for the forestry industry and men described being pleased that there *"is someone that does care about forestry"* (P11). Another participant in the maintenance stage of change said:

Well, it's good that an external party just cared enough to come along to a bunch of fat old guys and say "You guys now need to sharpen up". [Otherwise] we would just continue along our merry way. It was handy to have another party to come along and provide that impetus. (P9)

Men described the program as creating awareness of health issues and in particular weight related issues. The multiphase program that was delivered over a 12 to 18 months period ensured that men were not just alerted to health issues, but that these issues were regularly reinforced. One participant in the action stage of change said:

It was most probably [the WDP] program that made us aware of it [health issues] really. Before, most probably never thought about it much, but it's been pretty good really... it definitely made them think about it... (P1)

Although the program was described as *"not being too onerous"* (P9) there was reluctance by some of the men interviewed to participate. Many did not perceive there to be a problem with their weight and therefore did not identify a need for this type of program. They

mentioned comparing themselves to their peers in the forestry workforce and assessing that they did not have an issue. Others, primarily those in the pre-contemplation and contemplation stages of change, mentioned that although they thought that they were perhaps overweight, they did not want to admit this. A participant in the contemplation stage of change said:

I guess I hate admitting it really that I'm overweight, yeah, I am trying to avoid it at any cost I suppose. (P21)

Peer pressure and camaraderie between men to join together in the program were also referred to. A “do it together” approach was discussed by one man in the maintenance stage of change:

Oh, you know, “we got this thing kind of running I think you should do it.” Like this and I went “Alright I’ll give it a go...if you do”. (P7)

Each of the phases of the multiphase program was discussed by participants. *Education, BMI Competition and Lifestyle Coaching Program* were scrutinized and the key points are presented here.

Education

Education was considered to be important for creating awareness about health for men in this study. The mode of delivery was portrayed as appealing, and delivery in work time made it unavoidable. Participants suggested that the information provided was not new to them, but reinforced what was known. Participants felt that the information was targeted well for men, and they liked the practical and relevant focus of the sessions. Despite knowing much of the content delivered, it was felt that this knowledge was not translating into practice, so reinforcement was important. One participant in the maintenance stage of change said:

They are all messages that you hear often... you know, eating less sugar or eating less fat, not smoking and exercising and all those sort of things. Sure, you can come along and give us the education session on it. If anything, you are just preaching to people, not to the converted because they are obviously not converted... you’re selling a message to the people who know this, they are old enough and wise enough to know this stuff... So it’s not a bad thing because...reinforcing things like that can’t be done enough. (P9)

Self-empowerment was a strong focus for this sample and men highlighted that access to health information via sources such as the internet was a concern. It was noted that it was sometimes difficult to evaluate the credibility of sources and they appreciated having credible information provided through the project.

I think times have changed, you know, with the internet and, and all that sort of stuff, so people can actually go out and look after themselves. Not that everything is accurate though, but it's somewhere. (P5)

Participants commented on the usefulness of some of the practical tips that were delivered such as learning how to interpret the nutritional labels of food and simple exercises that men could do in the work setting. Men also spoke of being interested by facts that were retained:

What you told us about the cheese sausage, how long it takes to get out of your system and... really, you are not aware of it. (P18)

BMI Competition

Men reported the BMI competition as appealing and provided a clear goal to aim towards. Participants were motivated by the regular monitoring provided by the monthly weigh-ins and were driven by the competition and challenge. Although some “cheating” (P2) occurred in order to achieve weight loss, such as significantly reducing food intake and exercising in the hours or days leading up to the weigh-in, knowing that someone was tracking their progress was described as an effective approach in encouraging men to lose weight. Moreover, the BMI competition created a sense of being answerable to someone for their weight loss progress. Behaviours that hindered weight loss led to feelings of guilt. One participant in the maintenance stage of change said:

I think everyone enjoyed it [BMI competition]. They were all really responsive ... since we've stopped doing it;... there's not that sort of guilt [when you are doing things that hinder weight loss]. (P9)

Men spoke of the usefulness of being formally identified according to the BMI categories and found it to be a catalyst to initiate change. Despite the practicality of the BMI measure, some participants questioned the accuracy of the tool for men working in this

industry and felt that it did not take into consideration their muscle mass. One participant in the action stage of change said:

And I think BMI was a little bit out ... Yeah for our size and the strength of what we have to do I think we probably need to carry a bit more [weight] than what the BMI says. (P6)

Men generally did not have any issue with being weighed or with their peers knowing their weight. Some, however, expressed a reluctance to share their monthly weight when a weight gain had occurred, for fear of letting the team down. In contrast, where there had been a weight loss, participants expressed feeling proud to tell their peers of their weight loss:

All the guys they were quite happy to be up front and to be proud about, you know, 2 kilos down (P9)

The digital scales that were provided to each organisation were described as being convenient and easy to assess weight loss, and they were used as a constant reminder. Many of the participants spoke of getting on the scales between monthly weigh-ins for “mini-competitions” with small groups of men in their organisation. Participants discussed the camaraderie associated with the competition that provided them with an opportunity to discuss weight, diet, exercise and health in a non-threatening way. The majority of men commented on using humour and jokes to motivate each other leading up to the monthly weigh-in. This group focus prompted some men to exercise together and others discussed taking a whole of organisation approach whereby normal social activities were made healthier. For example at social club barbeques healthier food options were offered such as salads, wholemeal rolls and low carbohydrate alcohol. At another organisation, “Fat Free Fridays” were created for employees to bring healthy food options to share for lunch on that day.

Despite a competition being established between the organisations involved in this study, participants explained that most of the competition was within their own organisation. Interestingly several participants noted that it was more of an internal competition within themselves, rather than an explicit one between organisations.

It was good because I mean we are all different weights, so no-one was going, we weren't racing to the same weight, it was just weight loss I suppose. (P9)

The logistical issues of weighing participants in the forestry setting were highlighted as a problem by some men, particularly by those who were based entirely in the field. The

distance between employees meant it was difficult to get them together for one weigh-in session. A participant described this as follows:

The rest of us you know if we get busy on site we won't see the other couple of crews if they're in a different plantation. When it started we had all our chippers in the one plantation and then by the time we finished we were in three different plantations and sometimes 200km apart too. We have a depot and if they used it, it would be easy to manage, but half our crew are at [town A] and half of them are in [town B]. (P6)

Champions were described as being instrumental to the success of the program and particularly for the BMI competition, when their input was required the most. Men emphasised the importance of selecting the “*right people in the right places*” (P2) to fulfil Champion roles. Crucial Champion characteristics included having someone who was motivated themselves, but who could also motivate others. Men did not feel that the Champion needed to have particular weight loss experience, but good interpersonal skills were essential. One participant in the preparation stage of change spoke of the necessary characteristics of the Champion:

Someone with a good rapport. It doesn't matter whether they are the fattest [expletive] in the work place or, or they are someone that you know other blokes would aspire to be. Like at their age or whatever, it could be anyone. (P11)

Furthermore, it was emphasised that the Champion needs to be “*one of the blokes*”. One man who was a participant in the action stage of change and a Champion said:

It's not as if I'm Mr Muscleman or anything or Mr Fitness, it's just like I'm just one of the guys. (P9)

The ongoing enthusiasm of being challenged to lose weight declined over time. Men spoke of the difficulty maintaining their interest in the program towards its end.

I don't know, I think like most things ideas get stale after a while. So... every now and then something else has to be brought in to keep the enthusiasm level up. It's no different to work or anything else you get tired of, you get run down, you get worn out and the fizz in life disappears. You need something to spike it up in this sort of thing. (P16)

Lifestyle Coaching Program

Participants described their experiences with the Lifestyle Coaching Program (LCP). Most of the men who participated in this phase were in the action or maintenance stage of change and therefore their comments reflected this. The LCP was seen as “*the cherry on the icing on the cake*” (P4) for the multiphase intervention. It was perceived as being beneficial; however, the effectiveness of it assisting men to lose weight was unclear. Men expressed that the sessions were interesting in that knowledge about things specific to each individual was reinforced and/or gained. One participant in the action stage of change said:

...by then I'd sort of decided, “Well you've gone this far... you might as well go the rest of the way. And I found a lot of the things that [the coach] discussed were really interesting and there were things that I did not know at the time. (P4)

Participants valued the opportunity to have someone to debrief with and share things without judgement. To have a person to listen actively and objectively was considered key to the coaching.

I think it was good. The good thing is for you ...to be able to talk to someone. It's just that you can't share anything with others because I mean people don't listen to what you say. And sometimes it's just talking to someone that, that genuinely seems to be interested in what you're saying and why you're doing it ... I mean it's a matter of sharing, so yes I think it did help. (P5)

Other men enjoyed the sessions, but acknowledged some of its limitations. One man in the maintenance stage of change said:

Apart from a nice chat with someone who cared, you could lie if you wanted to or not. I mean, it was just a friendly chat “are you doing exercise [and] what are you eating” [and] suggesting a few changes that sort of thing. I mean it wasn't bad... It's always good to be reminded of that sort of stuff. (P9)

Feeling as though they were being monitored and responsible to someone was considered a motivator to ongoing behaviour change. The goal setting between participant and

coach was valuable and drove participants to achieve before each session. One participant in the preparation stage of change said:

That worked, not so much because of the information that was provided [during the coaching sessions], but more because you knew that you had someone coming to smack you around the head if you weren't doing the right thing. So it was like "Oh hang on, that thing is coming up [so] I'd better... pull my finger out". (P11)

A participant in the action stage of change said:

Someone is there checking up on you, saying "what have you done, what have you eaten?" It did make me think about it. Say, when I was down at soccer and standing around, I would think I should get up and run around the boundary because [coach's name] is going to call me shortly and ask me what exercise have I done. (P10)

The majority of men expressed that use of the telephone was a convenient and appealing mode of delivery, especially given their limited time available and the barriers associated with them often working across vast distances. However it was noted by a couple of men that they would have preferred face-to-face sessions, and suggested that such sessions may have been more effective for them. One participant said:

I actually understand everything better when I talk face-to-face, other than that I'm inclined I forget stuff. (P7)

Participants expressed satisfaction with the duration and frequency of the sessions. It was reinforced that duration and frequency should be dependent on the needs of the individual. One participant in the action stage of change said:

Depends on the people... If you're motivated enough this should be enough to kick you into it. Some people need to be ridden all the time. It's never going to be enough for some people: four would probably be too many. I would see it as good. (P2)

Overwhelmingly, the greatest issue associated with the coaching session was finding and committing to a time to complete the sessions with the coach. Men emphasised that in their busy work schedule this was often difficult; however they felt responsible for not making more time to be available for the sessions. This was made clear by one participant who said:

Because I remember every time she called it was a bad time and I was doing something you know and then it just ended up being that we'd try to make other times to talk about things and then it never ever happened. I mean, it probably would have worked, it's just that I, I had made a time with [the coach] to do it but when it came time to that day in time I ended up I was actually busy. So it was my own fault... what she did was right. She did the right thing, contacted me when I made times, but what I should have done was go up and just contacted her. (P7)

The coach was perceived to be too flexible with times and men expressed that they would have been more responsive to an assertive approach to scheduling the sessions.

We all totally appreciate [giving an option of appointment times] but giving us the option is just, it's a big out for us, because it is at bottom of the pile... All the guys are all just little mummies boys at the end of the day and they will do what they are told... when it would almost be better for [coach] to say to nominate the time... be a bit more aggressive about it and say I'm going to ring you at 4 tomorrow is that okay... I mean if she had done that to me I would have done the session in 2 days [rather than take weeks to find a suitable time for the session]. (P9)

In summary, *The 'Waist' Disposal Program* was valued by the participants in this study. There was acknowledgement of the challenges associated with implementing this type of intervention into the forestry workforce. No particular phase was seen as more effective or appealing than the other; however, all phases together were seen to build on other another and, as a package, provided men with motivation to change. One participant in the action stage of change said:

Individually I couldn't say they had [been more effective than another], you know if they'd been just offered as individual things. I'd say as a group they've be really good for me. (P4)

Although men described varying levels of effectiveness of the program with regard to their weight, all emphasised that the program created an awareness of health issues and was portrayed as a major instigator to adopt healthier lifestyles. This was portrayed by one participant in the action stage of change:

This program instigated me to think: I should probably lose a bit rather keep than plodding along like I am. (P10)

Finally, all participants who were involved at any phase expressed overwhelming gratitude for the program. As one participant in the maintenance stage of change said:

Thank you for the program because I think it's definitely helped me. (P5)

5.4 Summary of the Qualitative Findings

The themes identified in the study illustrate the complexity of adopting and maintaining healthy lifestyles for men working in the forestry workforce in rural areas. The central theme *My Health: My Choice* emerged as men involved in this study felt that their health and in particular their weight was their responsibility and their choice as to whether they wanted to make changes to improve it. The four sub-themes that built the core concept consisted of: *Identified Barriers*, *Identified Motivators*, *Identified Supports*, and *Experience with The 'Waist' Disposal Program*, and these have been explained. The findings have highlighted how men at various stages of change responded to the multiphase intervention. Participants who were in earlier stages of change were less likely to participate or else only complete phase one of the study. They identified more barriers and reported that they considered the barriers too significant to overcome to make changes to their lifestyle. Conversely, men in later stages of change identified a greater number of motivators and were clear about what encouraged them to change. It was suggested that those men in later stages of change (namely action and maintenance) were more willing to adopt strategies that facilitate change and were more responsive to the intervention. Importantly, these findings enable an understanding of the health related issues for men working in the forestry industry in rural WA in the context of the stages of change model. Furthermore, it has been ascertained what helps, hinders and supports these men to achieve healthier lifestyles. The next chapter will present the discussion of the quantitative and qualitative findings, together with the limitations and implications of the research.

Chapter Six

Discussion, Recommendations and Conclusion

6.1 Introduction

This chapter presents a discussion of the quantitative and qualitative findings of this research project. The discussion examines the findings in relation to the project objectives and pertinent literature. The key strengths of the project will be highlighted. A model that fits with the key findings will be presented and discussed. This chapter also identifies limitations of the study and provides recommendations for industry, men's health, worksite health initiatives and for future research. Finally, conclusions about the study's findings will be drawn.

6.2 Discussion

This study implemented *The 'Waist' Disposal Model* in industry worksites in regional WA (Aoun, Osseiran-Moisson et al., 2009). The study had three research objectives which were:

1. To assess the feasibility of undertaking this workplace intervention from the participant and organisation perspective.
2. To assess the impact of this intervention on improving lifestyle behaviours primarily in terms of nutrition, physical activity and reducing weight, taking into consideration the attributes, barriers and motivators that influence men's health related practices.
3. To assess the impact of this intervention on the stages of behavioural change, taking into consideration the attributes, barriers and motivators that influence men towards achieving a healthier lifestyle.

This study applied a mixed method approach to address these objectives, reflected in four hypotheses. Although cause and effect related to the intervention is not possible to claim as the study was not an RCT, the impact was measured in terms of change to risk factor profile over time. The findings are discussed in relation to the following three areas: *Feasibility of the multiphase health initiative with industry worksites in rural WA; Impact of the program on health outcomes; and Impact on stage of change.*

6.2.1 Feasibility of the Multiphase Health Intervention within Industry Worksites in Rural WA

The multiphase intervention used in this project, which is based on the earlier '*Waist*' *Disposal Model* of self-management (Aoun, Osseiran-Moisson et al., 2009) resulted in psychological and biophysical changes being achieved by men in the forestry workforce in regional WA. It therefore supports the findings of others that multicomponent worksite health initiatives are able to reduce health risks (Anderson et al., 2009; Muto & Yamauchi, 2001; Heaney & Goetzel, 1997). The feasibility of the intervention will be judged by the extent to which the program was successful. The DoHV (2010b, p.3), as part of their Healthy Living Program, identified 12 critical success factors for program effectiveness and sustainability, namely:

1. Local partnerships to lead and enhance recruitment, retention and sustainability
2. Use of existing groups and networks for recruitment or social media campaigns
3. Community involvement
4. Comprehensive and integrated approach
5. Targeted, tailored and flexible approach
6. Ongoing support and training for facilitators and opportunities to share experiences
7. Use of low-level strategies to keep participants involved
8. Group programs for mainstream populations incorporating at least one individualised session
9. Use of cognitive-behavioural approaches
10. IT-based strategies being used as complementary strategies
11. Modification of program materials for people from Indigenous and Culturally and Linguistically Diverse backgrounds and those with low literacy
12. 'How' is more important than 'what' for Indigenous people.

This project clearly addresses eight of these success factors, with the last four being inapplicable due to the model and target population. These key success factors or strengths help to explain why *The 'Waist' Disposal Model*, when applied in a rural industry was a feasible and effective intervention that has the potential to induce sustainable, long-term health and behaviour changes. The key strengths of this project are as follows:

The project created partnerships with forestry organisations and used existing networks to enhance recruitment and retention of participants. The organisations provided worksites that had a captive audience of rural men who were primarily in blue-collar occupations. The worksites offered existing networks of individuals already known to each other. The culture of such worksites, of which camaraderie and competition are major components, was leveraged to encourage ongoing participation, retention and the achievement of more positive health outcomes (Aoun & Johnson, 2002a, 2002b; NPHP, 2003). Furthermore, the partnership with forestry organisations to deliver health initiatives builds capacity at a community level, creates ownership and should enhance the sustainability of the behaviours on completion of the program (Harris, Oldenburg, & Owen, 1999).

Men's reluctance to seek help and use health services is a concern internationally (Commonwealth of Australia, 2010b; Smith et al., 2006; Smith et al., 2008). This reluctance was evident among the men in this study, with many reporting that they were unwilling to go to the doctor unless they felt that something was seriously wrong. The qualitative findings also support Australian literature that suggests that many men, particularly those from blue-collar workforces, exhibit strong masculinity characteristics including the perception that they need to be "physically big" and strong, which can lead to delays in seeking appropriate medical or lifestyle intervention (Aoun, Donovan et al., 2002; Courtenay, 2004; Kolmet et al., 2006; O'Kane et al., 2008a, Results section, para.7; O'Kane et al., 2008). The men in this study had an apparent lack of awareness about weight being a risk factor for illness. This echoes findings of other studies that have identified a major barrier to health action as being a lack of perceived need (Aoun, Donovan et al., 2002; Pinnock, O'Brien, & Marshall, 1998). Some have argued that this is because men generally lack interest in their health (Addis & Mahalik, 2003), whilst others have suggested that it stems from the long history of men being perceived, and perceiving themselves, as strong and independent (O'Kane et al., 2008a; Taylor, Stewart, & Parker, 1998). For these men, creating an awareness of their weight as a risk factor for ill health was an important instigator for behaviour change. Being labelled as obese was seen as a motivator to join the program, which was found also by Gray et al. (2009) in their study of men. Findings from this study suggest that the men who participated do care about their health, and that many of their poor lifestyle decisions can be attributed to the pressures of their work (such as long hours) and social commitments. Similar findings were found by Kolmet et al. (2006), in relation to Australian blue-collar workers. A key strength of this project was that it took place in a workplace setting, reducing some of the barriers to accessing health services for these men.

Worksite health programs have been shown to be more effective in predominately white-collar and younger cohorts (Rongen et al., 2013). The program described here managed to recruit a diverse range of men primarily from blue-collar occupations, aged between 18 and 65 years (mean age=41 years). This age range was lower than that of *The Rotary 'Waist' Disposal Challenge* project, which had an age range between 47 and 65 years (mean age= 57) (Aoun, Osseiran-Moisson et al., 2009). The few studies that have been conducted in the forestry industry indicate that workers within it are more likely to have risk factors for chronic disease at younger ages than comparable individuals within other industries and the national average (DoH, 2013a; COHFE, 2001; ForestWorks, Industry Skills Council, 2009; PricewaterhouseCoopers, 2010). The risk profile of participants in this study suggests that this was the case for many of the men involved and confirms the need for this type of intervention.

Adherence to weight loss programs is essential for achieving sustained behaviour changes and weight loss outcomes (Gray et al., 2009; Rössner, Hammarstrand, Hemmingsson, Neovius, & Johansson, 2008). The project went over an extended period of time (16 months) which is longer than most reported workplace health initiatives (Anderson et al., 2009; Benedict & Arterburn, 2008). The cohort that progressed through the program was made up of individuals who were more likely to be married or in relationships, and who were slightly older than the average forestry worker. This latter finding agrees with previous studies that have shown older adults are more likely to adopt healthy changes (Glanz et al., 1998). Participants in this study reportedly continued to participate because it was in their workplace, in work time and therefore convenient, it was to some extent unavoidable, and was at no additional cost. Furthermore, because their work colleagues were also participating they felt a level of responsibility to remain involved for their team. Encouraging and reinforcing camaraderie and peer support was a successful strategy applied here and by others in workplace initiatives (Harris et al., 1999; Rössner et al., 2008; Simpson et al., 2000). Although this program was effective in recruiting younger men, more work needs to be done to explore ways to retain them.

The intervention was a low cost, community-based initiative delivered in a real world setting to men at risk, but without a diagnosis of 'disease' and therefore not generally in contact with the health system. The forestry organisations were involved in the planning and delivery of the intervention, which according to the DoHV (2010b) is essential to ensure acceptability among participants, and to enhance recruitment and retention. Given the complexity of the forestry working environment, the strong involvement of organisations was essential in

identifying suitable modes of delivery of the educational and training material, and in conducting the intervention. Additionally, the intervention was both professional- and lay-led. This combined approach enabled the intervention to engage a large number of men, for a sustained period of time, for minimal financial cost. It was evident that the use of the Champions within the organisation was cost effective and promoted ownership of the initiative, which has been recognised by others who have used lay leaders in comparable programs (Aoun, Osseiran-Moisson et al., 2009; Aoun et al., 2013a, 2013b; Plescia, Groblewski, & Chavis, 2008; Richert, Webb, Morse, O'Tolle, & Brownson, 2007).

The program was comprehensive and tailored, having a flexible, yet targeted stage-based theoretical approach. The multiphase intervention comprehensively targeted several risk factors that contribute to the development of chronic disease, including insufficient physical activity, poor nutrition, smoking and alcohol, and examined changes that occurred to each of these as a result of the intervention. This is in contrast to some other workplace interventions that have focused on a sole risk factor and outcome, such as physical activity (Carr et al., 2013; Dishman, Oldenburg, O'Neal, & Shephard, 1998). While the present project examined multiple outcome measures, the main one was weight loss by means of improved nutrition and increased physical activity, as it is an obvious, measurable and concrete concept, which is consistent with the argument that men have a “functional view” of their bodies (Peerson & Saunders, 2011; Robertson et al., 2008). Donovan and Egger (2000) reported that men respond better to programs that are topic-specific and concrete, rather than abstract concepts (Aoun & Johnson, 2002a, 2002b), and these findings helped inform the design of the present project. The program was underpinned by theory. The behavioural health model, the TTM, was instrumental in framing the intervention and used as a guide for engaging participants to progress through the stages of change (Glanz et al., 2008). In response to the criticisms of stage-based interventions (Adams & White, 2005), the intervention included flexible inclusion and exclusion criteria for progression to the next phase of the intervention, due in particular to the potential to exclude individuals erroneously based on the misclassification of their stage of change (van Suijs et al., 2004). This enabled the non-linear progression of participants through the stages of change related to their progression through the phases of the intervention.

Engagement and support for Champions. Champions were used both as key point of contact, and to drive the project within the organisations and was a key strength of the

intervention. As was the case with the Rotary cohort in the study by Aoun et al. (2013b), the role of the Champion was instrumental in the success of the intervention within each organisation. It was apparent that Champions were the linchpin in the process of leading change, and, as described by Thompson, Estabrooks, and Dogner (2006, p.695), they are “transformational leaders” who are able to influence others to support programs similar to this one (Aoun et al., 2013a, 2013b). There is scope to explore this Champion role in a range of industries and identify ways to formalise it, which should help the ongoing sustainability of this type of initiative. The Champions received ongoing support from the researcher, however, there was limited interaction between the Champions and there is opportunity in future interventions to link Champions more and allow them to share experiences and support one another. Other work that has involved the use of Champions or lay leaders has included training provision for these individuals to prepare them for their roles (Aoun et al., 2013a; Brown, Henning, Caress, & Partridge, 2007; Campbell et al., 2002; De Bate & Plescia, 2005). The present study did not formally train the Champions, and therefore did not fully achieve this key success factor, but would be useful to do so in future interventions to ensure that they have appropriate skills to drive change more effectively.

Much of the literature suggests that men are often reluctant to participate in weight loss programs (Bye, Avery, & Lavin, 2005; Gray et al. 2009; Wolfe & Smith, 2002). Men involved in this study also spoke of being reluctant, but were encouraged because their peers were involved and Champions were encouraging their participation. Building on peer support was a key strength of this intervention. In addition, they described being engaged by the competition aspect of the program. Harris et al. (1999) highlighted that although many workplace initiatives start with reasonable participation rates, retention into subsequent phases of a program is often limited. The use of strategies such as competition and Champions within each organisation were strengths of this intervention and assisted with the recruitment and retention of men.

The overall initiative involved regular follow-up and use of low-level strategies to keep participants involved. There has been debate in the literature regarding the most effective level of contact for inducing behaviour change, as summarized by Rongen et al. (2013). Their meta-analysis, however, found that interventions with regular contact were more effective. The present study involved a monthly level of formal contact with participants and used low-level strategies such as emails, pamphlets and posters in between such contact.

The program was designed with two group phases (Education and BMI Competition) and one individualised phase (LCP). As expected, the education phase created awareness of health matters and despite focusing on those men in the pre-completion or contemplation stages of change, the approach included all men. Regardless of their stage of change, the education was effective and therefore supports the notion that rigid stage-based interventions can be exclusive and limit the reach of the intervention (van Suijs et al., 2004). It is well recognised that health interventions need to go beyond communication and education to achieve behavioural modifications (Engbers et al., 2005), hence the second phase of the intervention, the BMI competition, was used as an “action” phase.

The BMI competition was positively received and achieved both moderate behavioural change and reductions in the biophysical parameters measured. As expected, these changes were greater than those seen in the education phase. The appeal of these first two phases can be partially attributed to their delivery in a group format, consistent with other health initiatives targeting men (Aoun et al., 2013b; Gray et al., 2009) and they are reflective of guidelines that recommend group-based strategies in targeting behaviour modification (NHMRC, 2013a; SIGN, 2010).

The third, and final component of the intervention was the LCP, namely an individual component with a self-management focus, which was not received as well as had been hoped. The uptake for this component was minimal and can be attributed to several factors primarily related to barriers identified by the men, including lack of time. However, men who did participate showed significant improvements in psychological outcomes (stage of change and self-efficacy levels) and physiological outcomes (BMI and waist reduction, improved dietary intake and increased physical activity), as has been found in other counselling interventions (Aoun, Osseiran-Moisson et al., 2009; Aoun et al., 2012; Vale et al., 2003). The telephone was perceived as a suitable and convenient mode of delivery for the LCP. Indeed, the telephone is recommended as an appropriate mode of delivering health coaching for people unable to meet face-to-face due to geographic barriers or time commitments (Butterworth, Linden, McClay, & Leo, 2006; Gold, Anderson, & Serxner, 2000; Piette, 2005). In spite of this, however, a couple of participants felt that the sessions would have been more effective face-to-face, which is similar to the feedback received elsewhere (Aoun et al., 2012).

Behaviour change is not only determined by individual factors, but is also influenced by the environment (Benedit & Arterburn, 2008; Groeneveld et al., 2011; Kremers et al., 2006). The impact of environmental strategies within the workplace to promote behaviour change is well recognised (Groeneveld et al., 2011). Men in this study identified the forestry working environment as a major barrier to them adopting healthy behaviours. The long

working hours and lack of scheduled breaks were perceived to be the greatest barriers to overcome. Similar to findings by Blackford et al. (2013), flexible working hours were considered by the men to be the single most effective way to facilitate healthy behaviour adoption at work. Taylor (2011) further acknowledged that providing breaks and allowing flexible hours are known to have positive effects on health, and they are two environmental policies that could potentially be adopted in the forestry sector. Other environmental modifications suggested in the literature such as ensuring the availability of healthy food options, and the opportunity to exercise (Blackford et al., 2013; Engbers et al., 2005) are not as feasible in the forestry workplace. This is supported by Groeneveld et al. (2011) who noted that establishing environmental changes in blue-collar industries are difficult because workers are sometimes physically active and at different locations from day to day, as is the case in the forestry workforce.

Previous research suggests that behaviour changes which have been achieved during an intervention often deteriorate after participation finishes (Glanz et al., 2008; Gurung, 2014). The present study addressed sustainability in several ways including targeting already established networks in worksites, building capacity, increasing peer support, and involving participation over an extended time. *The 'Waist' Disposal Model* was feasible at the organisational and individual level in worksites in rural WA based on the number of successes identified here.

6.2.2 Impact of the Program on Health Outcomes

The primary outcome of *The 'Waist' Disposal Model* is to achieve a reduction in BMI (and hence weight) among those who adopt it. Other aims include enabling participants to adopt a healthy diet, take up regular exercise, and make other lifestyle changes that aid in the prevention of chronic diseases, such as reducing smoking and alcohol intake.

6.2.2.1 Impact on BMI and Waist Circumference

Nationally, the incidence of being overweight and/or obese is increasing at alarming rates (Cameron et al., 2003). In this study, *The 'Waist' Disposal Model* program aimed to target men who were overweight; as a consequence, it was expected that there would be few participants, if any, in the healthy weight range. It is noteworthy, however, that this intervention did manage to attract some men who were in the healthy weight range. At time two, 11 percent of participants were in the healthy weight range, but these individuals still presented with a high risk profile. Of the men who volunteered to be involved in this initiative

and continued into phase two when biophysical measures were taken, 89 percent were overweight or obese (52% were overweight and 37% obese). At this point, the mean BMI was 29.4 kg/m², which is considered overweight. Similarly, mean waist measurement at T2 was 102 cm, which is above the recommended value of 94 cm for men (NHMRC, 2013a). This represents a slightly higher number of overweight and obese participants compared to the total Australian male population aged over 18 years, estimated at 69.7 percent (ABS, 2013b). The consequences of being overweight or obese are profound (Avenell et al., 2004; Cameron et al., 2009; NHMRC, 2013a; WHO, 2000). Evidence suggests that reductions of even five percent baseline weight can improve health outcomes (National Obesity Forum, 2004). The multiphase intervention was effective at reducing BMI and waist circumferences of men in the forestry industry in rural WA to some extent. Due to individual fluctuations in weight, the group's average BMI and waist distribution remained relatively stable across the phases, although individual changes in BMI and waist measurements were apparent.

At an individual level there were reductions in BMI for participants involved in this study. Statistically significant differences occurred for participants who completed all three phases of the intervention and also for those who completed just two phases (education and BMI competition). Changes were small, however they are consistent with those found with other interventions targeting weight loss (Anderson et al., 2009; Bénédict & Arterburn, 2008; Engbers et al., 2005). Most of the changes were evident in the first six months of the BMI competition, with a mean weight gain evident between the sixth and eighth month, before a further downward trend. A similar pattern was also found by Aoun et al. (2013a) in their sample of men in Rotary Clubs in WA. Many studies identified in the international literature have focused on interventions that are of less than six months duration (e.g., Anderson et al., 2009; Dishman et al., 1998; Rongen et al., 2013). Studies of limited duration such as these, have therefore failed to consider seasonal variation that can occur with biophysical measurements (Iriyama & Murayama, 2014). Although, the current project continued well beyond six months, and reductions in weight at six months were evident, it cannot be attributed to seasonal weight fluctuations, as has been reported elsewhere (Visscher & Seidell, 2004).

There was a significant effect of the intervention on waist circumference. As with BMI, the major changes were seen in the first six months of the BMI competition, followed by slower reduction in circumference in the second half of the program. This finding is particularly important as waist circumference is reportedly a better predictor of percentage of body fat than other measures and is increasingly being used as an indicator of obesity (Visscher & Seidall, 2004; WHO, 2000). Furthermore, it has been shown to be a predictor for morbidity

including heightened risk for type 2 diabetes, the metabolic syndrome and CVD (Cameron et al., 2009; Janiszewski, Jannen, & Ross, 2007).

BMI was a sufficiently reliable measurement that was taken by the Champions in this study as has been the case in other work (Aoun et al., 2013b; Dhaliwal, Howart, Bejoy, & Wellborn, 2010). However, it was suggested by some men that this was an inappropriate measure for men in blue-collar industries, which was similar to Wirth, James, Fafard, and Ochipa's study of 20 men, who reported that men believed the BMI and weight charts are unrealistic. These criticisms are echoed in the literature that examines using BMI as a tool, particularly because it can overestimate the amount of body fat and fails to consider changes in body composition with age (Rothman, 2008). Given that this project was designed to be led by lay people in the organisations, BMI is an objective measure using scales where no additional training is required, unlike waist circumference measurements which is variable based on the user (although Champions followed a measuring protocol and received training and support from the researcher) (Aoun et al., 2012; Dhaliwal et al., 2010). Furthermore, BMI remains the main measure used in national and international guidelines (NHMRC, 2013a; NICE; 2006; New Zealand, Ministry of Health [NZ MOH], 2009), and is recommended by the WHO (2000), it is still considered the measurement of choice for this type of community based project.

6.2.2.2 Impact on Physical Activity

Prior to commencement of this project, the majority of men (77%) were already achieving sufficient levels of physical activity according to the Australian Guidelines (DoHA, 2010). The men in this study were comparatively more physically active than men in the same age bracket of the Western Australian population in general (Joyce & Daly, 2010). This is despite the relatively sedentary nature of many of the roles in the forestry workforce. The higher than average physical activity levels can perhaps be explained by the demographics of the population: rural men, generally with young families.

Despite the already high levels of physical activity being achieved by most men at baseline, this intervention was effective at encouraging men to engage in more physical activity, with all of the participants achieving sufficient activity levels at the completion of the intervention. Although numbers were small, the lifestyle coaching cohort (those who completed all three phases of the intervention) plateaued in the amount of exercise that they did during the BMI competition, but increased their activity levels during their time under the coaching program. This is similar to findings of the Rotary cohort study reported by Aoun et

al. (2013b), and supports the design of *The 'Waist' Disposal Model*, which aims to have each phase as a reinforcement of the previous phase.

There were several reported barriers for physical activity, with *lack of time, the working environment, family responsibilities* and *growing older* all identified as key impediments for men involved in this study to being more physically active. Studies on physical activity have reported comparable findings (Blackford et al., 2013; Booth, Bauman, Owen, & Grove, 1997; Brown & Gould, 2011; Dugdill et al., 2008; Escoffery, Keigler, Alcantara, Wilson, & Glanz, 2011; Sherwood & Jeffery, 2000; Zunft et al., 1999). Similar to an Australian study by Booth et al. (1997), the younger participants in this study indicated that family responsibilities were a major hurdle to exercise, while older participants highlighted age and its associated changes being a barrier to becoming active. Lack of time, however, was considered the most significant barrier for all participants. Although it was emphasised as a difficult barrier to overcome, Matson-Koffman, Browntein, Neiner, and Greaney (2005) suggested that there is a need for worksites to adopt policies of scheduled breaks and strategies that promote physical activity. In line with this, forestry organisations could consider ways in which they can modify their policies to support a more physically active workforce and reduce the time employees are sedentary (Carr et al., 2013; Thorp, Owen, Nechaus, & Dunstan, 2011).

A key motivator for men and women to exercise identified in the literature, is that of physical appearance (Brink & Ferguson, 1998; Brown & Gould, 2011; Heading, 2008; Fogelholm, & Kukkonen-Harjula., 2000; Sherwood & Jeffery, 2000; Strong, Ginis Martin, Mack, & Wilson, 2006). Although appearance was mentioned by some men involved in the study, it was not described as being a key motivator. Rather, they reported being motivated by becoming aware that their weight was a problem for their health. Many of the men in this study were not aware of, or ignored, the fact that their weight could be having detrimental effects on their health. Previous studies have identified that health and wellbeing are considered key personal motivators for physical activity and weight loss (Heading, 2008; Zunft et al., 1999). Similar to the findings of a qualitative study in rural Australia (n=19, female= 13, male=6) (Heading, 2008), a desire to be healthy into older age, to be around for their children and/or family, and to be better at their sport were identified as motivators for improving health.

Comparable to the work of others, this study applied a competition-based intervention with good effect (Hughes, Girolamio, Cheadle, Harris, & Patrick, 2007; Zinn, Schofield & Hopkins, 2012). Furthermore, the qualitative findings of men being *Driven by Challenges and Competition* is similar to the findings of Brink and Ferguson (1998) who found that competition was a motivator to start a weight loss program. It is well recognised that men are

generally more competitive than women (Frick, 2011), and the findings of this study suggest that men were responsive to the competition-based component of the multiphase intervention. In particular, they referred to the BMI competition, peer camaraderie, and being answerable to someone, as being motivators for exercising to achieve weight loss. They spoke of exercising with friends, and reported that the support they received from these or their peers was helpful in driving exercise-related behaviour. This is similar to other studies that have shown that the exercise habits of men are impacted by perceived levels of social support (Darlow & Xu, 2011; Leslie, Owen, Salmon, Bauman, & Sallis, 1999). According to du Plessis et al. (2013), competitiveness can be viewed as a masculine trait, and in many instances men display competitive behaviours in general workplace tasks. It has been highlighted that competition-based interventions are useful in attracting and retaining participants in programs and in driving health behaviour changes, as was evident in this study. However, little is known about the sustainability of these behaviour changes once the competition ends (Zinn et al., 2012). There is a need for some future intervention to incorporate long-term follow-up as part of the evaluation.

Participants in this study were given pedometers for their individual use as part of the BMI competition. They were initially willing to use the pedometers and reported that they were useful in encouraging activity levels, as has been found by others (Blackford et al., 2013; Dugdill et al., 2008; Pal, Cheng, Egger, Binns, & Donovan, 2009). However, compliance with wearing pedometers wore off quickly and men reported feeling that they were inaccurate, with many discontinuing their use as a result. Implementing an activity to encourage their ongoing use, as suggested by Thomas and Williams (2006), and perhaps a pedometer-based exercise competition such as that used by Zinn et al. (2012) would therefore be worth considering as a strategy to encourage compliance in future interventions.

6.2.2.3 Impact on Nutrition

For men involved in this study, improving their nutrition was a key way that they could effectively reduce their weight, given the restrictions of their work environment that typically prevented them from increasing activity levels at work. Similar to other studies, this project measured the effect of the intervention on fruit, vegetable, fibre and fat intake (Engbers et al., 2005). As the intervention progressed, participants increased their consumption of high-fibre and low-fat foods. The improvements to healthy dietary habits were statistically significant across all phases of the intervention, but the greatest nutritional improvements were achieved by those who participated in all three phases of the project. In contrast to some programs that have focused on making changes to the worksite environment in order to make healthy choices

easier (Ni Mhurchu et al., 2010), the nature of the forestry worksite meant that this study employed strategies that focused on the individuals' sense of responsibility to make the same choices.

The reported barriers preventing improved nutrition primarily related to the forestry working environment. Long working hours, lack of time, lack of access to healthy food options, and being tempted by unhealthy food (primarily from roadhouses), were findings also reported by Blackford et al. (2013) and Escoffery et al. (2011). Access to healthy foods has been highlighted as an issue at other worksites (Blackford et al., 2013; Escoffery et al., 2011), and recommendations to address this barrier have included environmental modifications such as offering healthy food options within the workplace (Engbers et al., 2005; Escoffery et al., 2011; Ni Mhurchi et al., 2010). This recommendation is not appropriate for the forestry workforce as its personnel are often involved in field work activities and supply or purchase their own meals. Furthermore, their remote working locations mean that access to food is often limited. Initiatives that target roadhouses and the like to supply healthy food options, therefore, would be beneficial.

Participants reported their partners as being instrumental for adopting a healthy diet. Men in this study reported that their wives often selected and prepared the food that they consumed. The importance of wives in facilitating and supporting healthy food choices and portion control has also been reported by others evaluating workplace interventions (Muto & Yamauchi, 2001). This finding emphasises the desirability of involving partners in the program. Although this study attempted to involve partners informally, there is more scope to increase this focus, subject to targeting resources appropriately.

6.2.2.4 Other Health Outcomes

In addition to the health outcomes discussed above, this project aimed to reduce two key unhealthy lifestyle behaviours; namely, excessive alcohol and cigarette smoking, historically the culture within the blue-collar workforce in Australia (Turrell, Stanley, de Looper, & Oldenburg, 2006; du Plessis et al., 2013). Excessive alcohol consumption is associated with risks to health both in the short and long-term. According to the NHMRC Guidelines, consuming more than two standard drinks per day presents a health risk over that individual's lifetime (NHMRC, 2009b). In 2011-12, 29 percent of Australian men aged 18 years and older consumed alcohol in sufficient quantities to pose such a risk (standardised for the age structure of the population) (ABS, 2013f). At baseline, as many as 90 percent of the men involved in this study reported drinking alcohol, the median number of standard drinks consumed per week was 10, with a range of one to 90 standard drinks. For many men at

baseline (19.5%), their consumption was greater than the NHMRC guideline levels which, stated that more than 28 standard drinks per week for men increases the incidence of alcohol-related disease (NHMRC, 2009b). These findings are supported by Berry, Pidd, and Roche (2007) who examined alcohol consumption patterns among the Australian workforce and found that 44 percent consumed above the NHMRC guideline levels at least occasionally. This level of consumption was more prevalent in young workers and those in blue-collar occupations, as was found in this study as well.

The multiphase intervention described in this project was modestly effective in reducing alcohol consumption; while self-reported alcohol intake remained at 80 percent at completion of the program, there was a trend towards a reduction in the mean number of standard drinks per week from eight at T1 to five at T4 for the LCP cohort, which is within the acceptable levels of consumption determined by the NHMRC (2009b). It should be noted that participants who consumed large volumes of alcohol tended not to continue through to the later phases of the project. Despite alcohol consumption not being the primary focus of this study, it has illustrated that worksite interventions that target alcohol intake are highly desirable as they can assist employees (particularly blue-collar) to reduce their consumption.

Smoking remains the largest single preventable cause of morbidity and mortality in Australia (AIHW, 2013a). The rates of smoking for men aged over 18 years in Australia has been steadily declining, with 18.3 percent smoking in 2011-12 (ABS, 2013b). This national figure is less than the 26.4 percent of men in this study who reported smoking at baseline, although smoking rates across Australia have recently been reported as higher (22%) in regional areas generally compared to major cities (15%) (AIHW, 2013a). All of the participants who were smokers at the commencement of the intervention and completed all three phases, had quit smoking by the end of the program. After taking into account those who dropped out, this represents a reduction in smoking from 13.3 percent at baseline. It was apparent that the men who reported excessive cigarette smoking were less likely to move through the phases of the intervention. Given this, it is recommended that future education interventions address smoking, as this may be the only opportunity to reach this group of men at risk. Furthermore, organisational policies that ban or restrict smoking have been effective in deterring smoking elsewhere (Cahill & Lancaster, 2014; Callinan, Clarke, Doherty, & Kelleher, 2010) and should be considered by forestry organisations as well. The program was effective at inducing behaviour change and to some extent changes to health outcomes were evident, however more research is needed to explore the long-term impacts as a result of program participation (Chapman-Novakofski & Karduck, 2005) and to identify ways of sustaining these behaviour changes.

6.2.3 Impact on Stage of Change

Exploring the impact of the multiphase intervention on the stages of change was a key focus of this study. The primary directional hypothesis was that *The 'Waist' Disposal Model* of self-management would be successful in progressing and sustaining men through the different stages of behaviour change. The findings of this study suggest that the model had a positive impact in this regard.

The findings relate to stage of change at each phase of the program, and the levels of participation illustrate that individuals at the later stages of change for weight loss, nutrition and physical activity were more likely to utilise the program than those in the earlier stages of change. This supports previous work which suggests that behaviour change strategies continue to appeal to individuals who are in the later stages of changes and therefore have higher levels of readiness to change (Glanz et al., 2008).

The 'Waist' Disposal Model of self-management was designed to be flexible and target men at various stages of change, rather than providing individually stage-matched interventions, which have numerous well documented problems (Adams & White, 2005; Riemsma et al., 2003; van Sluijs et al., 2004). Nonetheless, the multiphase intervention was designed to target health behaviour change in a staged progression (Glanz et al., 2008) by encouraging participants to move through the stages by first creating knowledge and awareness with health education, then providing participants with the tools and focus to implement behaviour change with the BMI competition, and finally by assisting participants to achieve and maintain healthy behaviours with the LCP.

Following the education phase, there were positive (if non-statistically significant) changes noted in participants' psychological readiness to modify behaviours relating to all stages of change measures including weight loss, fat intake and exercise. It was hypothesised that during the BMI competition, participants would move from the contemplation to preparation stage of change; to some extent this was confirmed. In addition, there were relatively large (and statistically significant) shifts from the preparation to action and maintenance stages of change, for both weight loss and exercise. These findings are consistent with what was expected from the competition compared to education alone, and were similar to the findings of *The Rotary 'Waist' Disposal Challenge* project (Aoun, Osseiran-Moisson et al., 2009). This was particularly the case the first six months of the competition, which echoes the findings not only of Aoun, Osseiran-Moisson et al. (2009), but also those of several other studies (e.g., Iriyama & Murayama, 2014; Zinn et al., 2012).

In the LCP, there was a positive progression towards readiness to adopt or maintain behaviours related to weight, fat intake and exercise; however the numbers are too small for these changes to be statistically significant. The majority of participants (93.3%) were in the action stage of change related to weight loss prior to the LCP, which suggests that they were already implementing changes. This fits with the literature that suggests that self-management initiatives, such as this aspect of the program, are more appropriate for those who are motivated and have a high level of readiness to change (Aoun, Osseiran-Moisson et al., 2009; Glasgow, Vogt, & Boles, 1999).

Generally it was noted that there was a forward progression of participants through the stages of change, although regression was noticed in some participants. This non-linear pattern is similar to that reported by other authors (Glanz et al., 1998; Prochaska et al. 1992). In addition, it was apparent that participants often skipped stages, a finding that was similarly observed by De Nooijer et al. (2005, p.31) who suggested that “spontaneous transitions” through the stages do occur.

It was evident that those who reported a change in their stage, generally also reported modest increased self-efficacy, and improved measures of nutrition and physical activity. It was observed also that the later the stages of change, the larger the increase in the amount of change achieved. Similar observations were reported also by Glanz et al. (2008), who proposed that interventions should aim to move participants out of the pre-action phases (pre-contemplation, contemplation and preparation) and keep them in the action and maintenance stages of change. Future interventions should therefore focus on applying strategies that promote accelerated movement through the stages in order to increase both the chance of behaviour change occurring, and the extent to which it does.

According to Chapman-Novakofski and Karduck (2005), self-efficacy levels increase following lifestyle-related educational interventions (albeit diabetes-focused interventions). Similar results were found in this study with participants’ levels of self-efficacy improving following education. However, there were more significant changes in self-efficacy noted as they started to progress through the “action” phases of the intervention and gain more confidence in their ability to make healthy changes to their diet and activity levels.

6.3 Model to Support Findings: The Health Belief Model

The findings of this study that were derived from rural men working in the forestry industry can be closely mapped against the Health Belief Model (HBM). The HBM is useful in predicting responses to the prevention or control of health-related conditions by hypothesising that health related behaviours are determined by health beliefs and readiness to take action (Glanz et al., 2008). According to the HBM the probability that an individual will perform a behaviour depends upon six factors; perceived susceptibility, severity, benefits, barriers, self-efficacy and cues to action (Webb, Sniehotta, & Michie, 2010). The model has been used extensively to explain people's responses to diagnosed illness (Bayat et al., 2013), however it has been used less often in relation to people who are at risk of disease but do not currently have evidence of this, such as the participants in this study.

The model has been applied to guide some health prevention interventions that target physical activity and nutrition (Abood, Black, & Feral, 2003), smoking (Morris & Wilson, 2005) and weight management (Daddario, 2007), however empirical support for this is limited. The model is useful in helping to explain changes to and maintenance of health-related behaviours, which were an objective of this study. Furthermore the HBM has been used here in a validation role and to illustrate that findings of this study are similar to other work conducted in this field (Aoun, Donovan et al., 2002). Although this multiphase intervention was not theoretically based on the HBM, it is useful to consider the relevance of this model in explaining behaviour changes that occurred. This can be illustrated in Figure 6.1, which demonstrates the main themes of this study in parallel with the concepts of the HBM. The key themes of the study addressed the six components of the HBM which are supported by participants' quotes and summarised in Table 6.1.

Perceived Susceptibility, Severity and Benefits

Perceived susceptibility, severity and benefits can all be linked to the central theme of *My Health: My Choice*. Men in this study were reluctant to discuss health-related issues and felt that they would be perceived as weak if they did. They felt that in general they should address their health concerns by themselves, which is mirrored in other work exploring men's health (Heading et al., 2008; O'Kane et al., 2008b). Men lacked awareness of weight being a health issue, as has been the case reported elsewhere (Sabinsky, Toft, Raben, & Holm, 2007). They described comparing themselves to others and were genuinely surprised when made aware of being in the BMI obese category. This ultimately alerted them to their increased susceptibility and severity of potential health-related problems. Furthermore, men in the

earlier stages of change had lower levels of recognised susceptibility. As expected, those in the later stages of change were more inclined to adopt changes in behaviour.

There was a general lack of awareness of the extent to which being overweight posed as a health issue. Men in the earlier stages of change in particular could not easily identify the benefits of changing habits. In contrast, men in the later stages of change were more likely to see the benefits to themselves, their families and their employers.

Perceived Barriers

Similar to other research, men in this study identified several factors that inhibited their ability to change their health behaviours (Brown & Gould, 2011; Heading, 2008). Those in the earlier stages of change in particular identified many barriers and perceived them as difficult to overcome. Despite having the same working conditions, men in the later stages of change tended to identify similar barriers, but could recognise ways to overcome these and adopt healthy behaviours.

Perceived Self-Efficacy

Perceived self-efficacy aligns with *Identified Supports* that were identified as a theme in this study. It was evident that men in later stages of change believed that they had the ability to make changes in their life, had higher levels of self-efficacy and could identify supports in their lives that would assist them to make and maintain changes. In contrast, men in the earlier stages of change found it difficult to identify supports, had lower levels of self-efficacy, and many of them chose not proceed through the phases of the program.

Cues to Action

Cues to action can be closely mapped against the *Identified Motivators* theme, where men expressed what they perceived to motivate them to adopt healthy changes. Men in the earlier stages of change found this difficult to do, whereas men in the later stages of change found it easier. The project phases aided them to progress through the stages of change and achieve behaviour modifications, which in turn enabled them to see physiological outcomes such as weight loss.

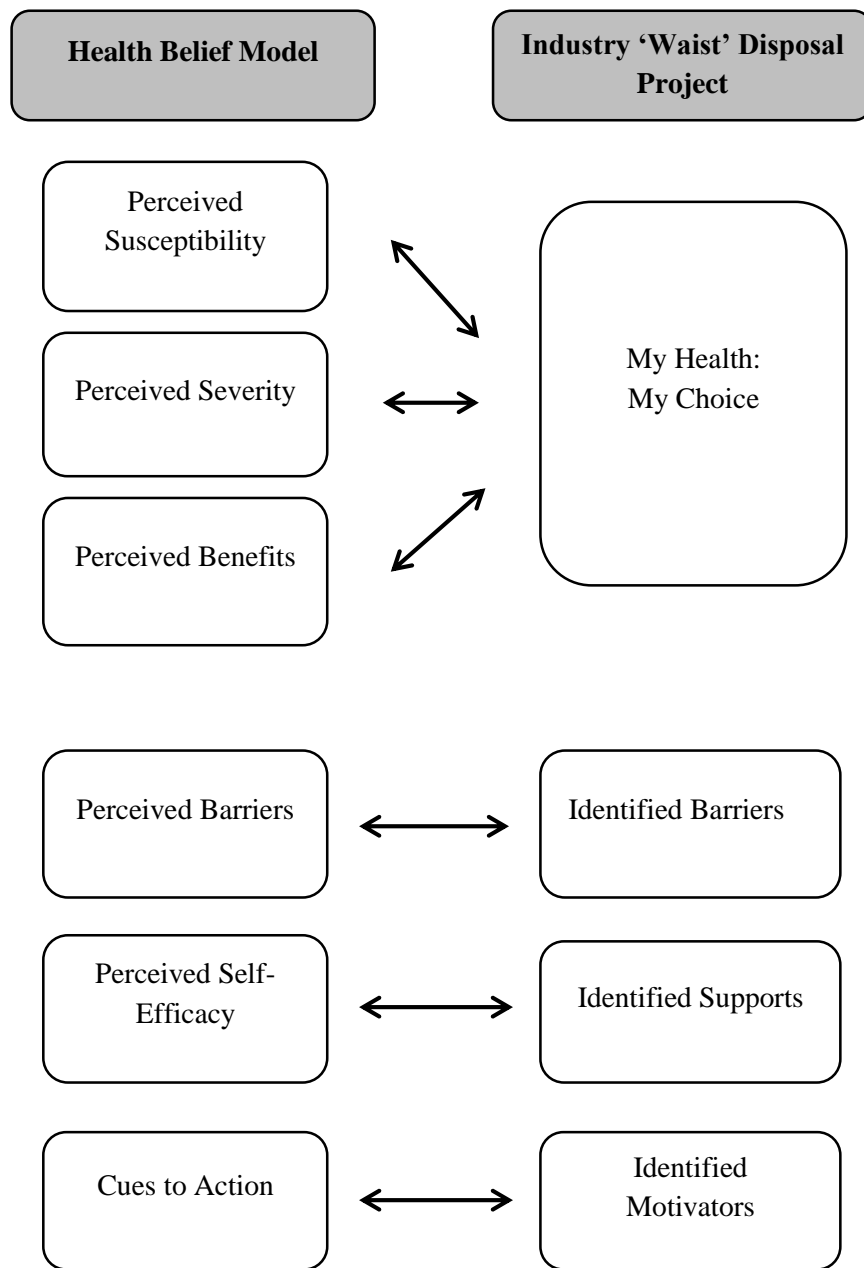


Figure 6.1. Health Belief Model mapped against key qualitative themes

Table 6.1. Industry ‘Waist’ Disposal Project themes mapped against the Health Belief Model

Industry ‘Waist’ Disposal Project	Health Belief Model	Participant quote
My health: My choice	Perceived Susceptibility	<i>I had a fair idea of my weight, but I was surprised when I was measured and saw where I was on that [BMI] chart (P11).</i>
	Perceived Severity	<i>I used to be a smoker years ago as well, and I’ve got a pretty bad family history. My father died when he was 48 from a heart attack or heart related [illness]. My Mum has got diabetes, my Nan had diabetes,... my dad’s brother died when he was 48. So when I go to the doctor he just keeps reinforcing that “you know you are in the same category” with carrying extra weight and bad family history. So you need to start un-ticking some of the boxes, so it’s always been on my mind anyway. (P13)</i>
	Perceived Benefits	<i>But that was just a bonus having you come along, but I thought “This is great,... we’ve got someone else coming in who wants to help the company do something about it... I think if more companies did something about their workers, the productivity from the workers would actually be better. (P6)</i>
Identified Barriers	Perceived Barriers	<i>Most weeks you know there is no time in the day, you are just sort of tired and that’s a bad recipe because when your body is tired you want to eat more... I mean you work a fairly active role but it’s not huff and puff exercise either, so it’s just a bad combination I suppose. (P13)</i>
Identified Supports	Self-efficacy	<i>I think you have made me more aware of the problems around me and confirmed what I always thought, that you can do something about it if you want to. I suppose, subconsciously I do eat better now than I would have a few years ago.(P16)</i>
Identified Motivators	Cues to Action	<i>Motivating me is probably the kids. I know if I kept putting on weight I would be heading towards heart attack or something like that you know. And then you know I’ve got 4 kids to raise and look after so that was sort of my motivation. (P7)</i>

6.3 Limitations of the Study

There were a numerous key strengths of this study which have been highlighted under the feasibility section, however, there were also a number of limitations. Firstly, the quasi-experimental design used, meant there were methodological limitations, including the difficulty (if not impossibility) of including a control group. However, the primary aim of this study was to assess the feasibility of implementing this type of program in a rural workplace. Furthermore, it was delivered in a real world setting and was designed to fit into a specific workplace, thus restricting the ability to conduct an RCT.

Secondly, evaluating multiphase interventions that focus on incorporating stages of change is often fraught with difficulty because such interventions typically include several complex components and often yield many small effects (Michie et al., 2009; Patton, 2002). It has been proposed that in order to evaluate multiphase interventions effectively, a complex evaluation design strategy is required (Weitzman, Mijanovich, & Silver, 2009). To address this, and in accordance with the suggestion of Adams and White (2005), the project included pre- and post-evaluation at each phase, and also compared combinations of the components of the multiphase intervention longitudinally.

A third limitation of this study relates to the location, which was restricted to the South West of WA and the relatively small sample and high attrition rate, all of which will impact on the ability to extrapolate and draw inferences from the findings. The convenience sampling method further limits generalisability. However, the sample used does enable a specific focus on the population of rural forestry workers in this part of WA, and perhaps more broadly in other parts of the country. There was an element of self-selection in recruiting the study cohort, and consequently those who participated were possibly more motivated and ready to consider making changes to their lifestyles (Soler et al., 2010). The most adherent or compliant participants were the most likely to remain in the program until the end, therefore skewing the results. However, according to the stage of change measure, nearly a third of the participants were in the pre-contemplation stage of change in their readiness to lose weight at baseline. There were high attrition rates, particularly between phases two and three, which is probably at least partially attributed to the transient nature of the forestry workforce. Despite these limitations, important behavioural and psychological changes attributable to the intervention were nevertheless noted.

Finally, some limitations related to data collection are worth commenting on. A well-known limitation is the over- and under-reporting of desired behaviours when using self-report

measures in behavioural studies, which has the potential to skew the effects of the intervention (Potsakoff, MacKenzie, Lee, & Podsakoff, 2003; Rongen et al., 2013). Some variation in the self-report compared to the Lifestyle Coach stage of change measure was noted. As expected the self-report measures were higher than those reported by the Lifestyle Coach in the last phase. However for consistency of data analysis throughout all phases, the self-report measure was used. Furthermore, it has been highlighted in the literature that a degree of stage of change misclassification can occur with self-reported stage of change related to physical activity and dietary behaviour (van Sluijs et al., 2004). The project described here did accommodate this potential issue; however, by being flexible in relation to the inclusion criteria for each intervention phase, and by not excluding participants based solely on their self-reported stage of change.

A key focus of this study was the use of Champions or lay leaders to collect the biophysical measurements. Although it is important in terms of building capacity, the use of volunteers, the Champions, to collect data measurements in the BMI competition also has the potential to introduce bias. This was minimised by training each of the Champions, calibrating their instruments and having a measuring protocol. A further limitation of the biophysical data collection was that these data were not collected at time one (pre-education), but instead were first collected at time two (post-education and pre-BMI competition). It was felt that some men would be deterred from participating if they were asked to provide their biophysical data before starting the program and building rapport with them. Unfortunately, this meant that the effect of education on biophysical measurements could not be assessed, and it is possible that men had already achieved BMI and waist reductions prior to the first measurement.

6.4 Recommendations

There are a number of recommendations that follow from this study and which relate to the forestry industry, men's health, workplace health initiatives and future research.

6.4.1 Forestry Industry

The forestry worksite is a challenging environment within which to implement health initiatives. Its complexities, including the long working hours, remote and different locations, diversity of roles and employees etc., mean that implementing any health-related initiatives is difficult. Furthermore, these challenges explain why there is a lack of research internationally into health promotion for forestry workforces. However, the baseline findings of this study

emphasise the high risk profile that exists among this population for ill health, as it underscores the need for attention and remedial action.

The forestry worksite provides many challenges to employees wishing to achieve and maintain healthy lifestyles. It is well documented that behaviour change is determined by both individual and environmental factors (Engbers et al., 2005; Groeneveld et al., 2011). It has also been highlighted that changes to the environment for blue-collar workers are particularly difficult (Groeneveld et al., 2011).

There is a need for widespread policy and cultural change in the forestry sector that incorporates strategies promoting increased physical activity and healthy dietary choices at work. Recommendations that follow from the results of this project and are related to changing the forestry work environment to influence conscious and unconscious behaviours include:

- The promotion, where possible, of activities to be undertaken on foot rather than in vehicles.
- The introduction of flexible and scheduled breaks.
- The provision of areas on-site for workers to exercise during breaks, or during certain periods such as while trucks are filling or being uploaded.

Employers need to be informed of the potential benefits of improving employee health, such as maintaining a stable and sustainable workforce, because of the positive effects of improved health on productivity and reduced absenteeism (Goetzel & Ozminkowski, 2008; Ronger et al., 2013).

6.4.2 Men's Health and Obesity

Internationally, gender differences in health continue to be apparent (WHO, 2010). Men in rural areas, in particular, are at risk and often experience a health disadvantage (O'Kane et al., 2008a). Meanwhile, the prevalence of obesity in rural men is increasing at alarming rates (AIHW, 2010), as reflected by the risk profile of men in this study. Obesity prevalence trends are an international concern and there has been much attention paid to identifying evidence-based strategies and interventions which tackle the growing obesity epidemic. Government policy has previously recognised it as a priority, and there have been widespread health initiatives to address this (NHPA, 2013; CO-OPS Collaboration, 2013; DoH, 2013b; DoH, 2013c; Health Direct 2013; NPHT, 2010; Obesity Prevention Australia, 2010; Physical Activity, Nutrition & Obesity Research Group [PANORG], 2012). Despite the attention, there remains a lack of initiatives that focus specifically on rural-based men who work in blue-collar

occupations. There is a need for public health attention at local, state and national levels to address the health disparities of Australian rural men.

The recruitment and retention of men in weight loss programs is a well documented problem (Bye et al., 2005; Gray et al., 2009; Wolfe & Smith, 2002). Despite the apparent reluctance to join such programs, this study applied some strategies that effectively engaged men, particularly younger men, who are often difficult to involve in health prevention. Accordingly, engagement of these men may act not only as preventative, but as early intervention. There is a need to explore further how men respond to weight loss programs, specifically those based in rural areas.

The social construct of masculinity and its associated roles that are often adopted by men and were evident in this study, appear to have a major influence on men's health behaviours and their decisions to seek help and engage with health services (Aoun, Donovan et al., 2002; Kolmet et al., 2006; Mahalik et al., 2007). There is a need for widespread culture change regarding masculinity and the social conditioning of men, especially for rural men, for whom the male gender role is arguably stronger than for their metropolitan counterparts (Aoun, Donovan et al., 2002; Huggins, Somerford, & Rouse, 1996).

6.4.3 Rural Worksite Health Initiatives

Worksites provide a significant opportunity to engage with large numbers of people, particularly men who are otherwise difficult to reach with health initiatives (Atlantis, Chow, Kirby, & Fiatarone Singh, 2006). The benefits of worksite health initiatives are for both the employee and employer (Marshall, 2004; Robroek et al., 2011), although conducting worksite health initiatives can be challenging (Ni Mhurchu et al., 2010). The need for logistic rigour in delivering programs in community-based settings, addressing employee and employer needs, and restricted time frames and budgets all contribute to the complexity of worksite health interventions (Ni Mhurchu et al., 2010; Simpson et al., 2000). Despite an extensive number of initiatives in worksites internationally, there remains a need for rigorous, independent, long-term evaluation of worksite health initiatives (Ni Mhurchu et al., 2010), particularly for those targeting blue-collar workforces in rural Australia.

Health services, health professionals, health planners, researchers and the like should be encouraged to consider the worksite as a suitable place to deliver health initiatives and use the opportunity to capitalise the existing networks that worksites offer. Rising healthcare costs and continual budget cuts suggest that there will be an increasing need to be more resourceful in the way primary health initiatives are addressed. There will be increased responsibility on

individuals to look after their own health, and it will be essential for those interested in improving workforce health to join forces with industry if effective and lasting improvements are to be made. There will be a need to steer away from one-off, short lived programs, and to shift the focus from individual behaviour change to more strategic, comprehensive approaches that build capacity and are sustainable. This requires a shift in thinking, so that interventions are not short-term programs but become an entrenched part of the culture (Marshall, 2004) and part of a larger network that can continue to encourage change and sustain behaviour without continued investment from the health system.

6.4.4 Future Research

This study has stressed the need for more research in rural and regional Australia. Despite men's health attracting increasing attention, and a number of studies relevant to men in regional Australia, there is a lack of translational research in this area. This work has highlighted interventions that are appropriate and moderately effective at targeting health outcomes in rural men; however, it is necessary that these interventions are translated into policy and practice at both service and community levels. This study has demonstrated that a workplace health intervention which targets men employed in a blue-collar workforce is feasible. However, to strengthen the reliability and validity of its findings, it is important that this study be replicated with a larger sample, ideally a multisite study and possibly in more than one state. It is recommended that a more rigorous design be applied, such as using a control group to test the true impact and effectiveness of the intervention at each phase. It would be valuable also for this study to be replicated in other workforces that employ large numbers of men in regional WA such as mining companies, agricultural companies, abattoirs, and other large organisations such as Western Power, Telstra, Cooperative Bulk Handling (CBH) and Port Authorities. This study demonstrated effectiveness in recruiting younger participants (aged 18-35 years), however it was evident that they were more difficult to retain, with older men being more likely to continue through all phases of the intervention. Future research needs to focus on how to attract and retain younger participants to health programs with the goal of early intervention.

There is increasingly widespread use of the stage of change measures in health research, however there are many reported issues associated with using self-report tools as experienced and discussed in this study. There is a need for more reliable and valid methods of assessing stage of change that are not reliant on self-report methods (Adams & White, 2005; Donovan et al., 1998; Howarth, 1999). There are a number of recent tools that use pictures or vignettes to assess stages of change in weight management (Alahuhta, Korkiakangas, Keränen, Kyngäs,

& Laitinen, 2011), and these would be worth exploring further, particularly among men in rural, blue-collar workforces.

One of the key areas that require further attention relates to assessing the sustainability of adopted health habits, and whether long-term changes that result from health initiatives are maintained, thereby leading to reductions in the long-term risk for acquiring one or more chronic diseases.

Additional suggestions for future research include the following:

- Undertaking a cost/benefit analysis of *The 'Waist' Disposal Model* for the management of overweight and obesity
- Exploring the impact of lifestyle interventions in the prevention of weight gain or maintenance compared with weight loss, particularly in younger men
- Comparing the effectiveness of specialist weight management care versus community-based weight management interventions such as *The 'Waist' Disposal Model*
- Exploring further the role of Champions in leading this type of intervention in workplaces to build capacity within the organisation
- Identifying the characteristics of non-participating, eligible workers in worksite interventions.

Generally, there is a need for studies to report in more detail the lessons that have been learnt from implementing successful and unsuccessful health initiatives in workplaces. Internationally, a well reported problem with health initiatives (particularly targeting men) is the recruitment and retention of participants. In spite of this, there is a lack of literature that clearly identifies strategies that have been applied to recruit and retain participants (Benedict & Arterburn, 2008; Harris et al., 1999; Rongen et al., 2013). There is a need for more detail from researchers about recruitment (including non-participation), implementation, compliance, retention and evaluation, so that others can use this important data to guide further studies and practice.

6.5 Conclusion

This research project has examined the feasibility and impact of implementing a multiphase health intervention designed to reduce lifestyle risk factors for rural men in the forestry workforce. The findings have demonstrated that the intervention was effective at

engaging rural men and was able to reduce risk factors for chronic disease. Furthermore, the study also explored the complexities of factors that contribute to men initiating and maintaining healthy behaviours. A particular strength of the project was that it was implemented in a real life setting and targeted a hard-to-reach, at-risk population of men living in rural areas. Moreover, it was community-based and both professional- and lay-led. This study has responded to the international call for approaches to overcome barriers and find ways to engage and motivate men to adopt healthy behaviours. The model can be replicated in other rural-based industries and communities, because it is low cost, requires minimal input from healthcare services, and relies mostly on involvement from industry and existing networks.

The key success factors of *The 'Waist' Disposal Model* in the forestry workforce are as follows:

1. The project created partnerships with industry, capitalised on existing workplace networks and fostered peer support among the workforce. This enhanced recruitment, retention and sustainability.
2. It was a community-based multiphase intervention that involved the community in planning, development and delivery.
3. The multiphase intervention with a flexible, yet targeted stage-based approach provided a comprehensive intervention that was appropriate to the needs of the individual. The intervention applied group-based and individual phases tailored to the needs of participants.
4. Based on the TTM, it was designed to promote participants to progress through the stages of change as they adopted healthy lifestyles.
5. It had regular follow-up that was supported with low-level strategies to maintain participant engagement.
6. It applied telephone coaching, which was flexible and useful for people who were unable to meet face-to-face due to geographic barriers or time commitments. This particularly has implications for healthcare delivery in rural and remote areas.

The strategies applied in this study are transferable to target men living in rural areas, where accessibility and availability of such interventions is not often possible. The study's findings are relevant to employers, program planners and researchers. It further supports the implementation and evaluation of worksite multiphase interventions that focus on achieving healthy outcomes through changes in diet and physical activity. Although there is a need for further research in this area, the study is valuable in providing insight and direction for future policy, practice and research.

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INFORMATION SHEET FOR PARTICIPANTS

Study Title: **Industry “Waist” Disposal Challenge**

PART 1: EDUCATION SESSIONS

Researcher: Kristi Holloway

PhD Student, Western Australian Centre for Cancer and Palliative Care,
Curtin University

Supervisors from Curtin University:

Professor Samar Aoun and Professor Duncan Boldy

We are running a health program in your workplace. We would like to help you reduce the chance of developing chronic illnesses such as Type II Diabetes and heart disease. The health program has 3 parts and you are invited to participate in Part 1:

- **Part 1- Education**
- Part 2- Monthly weighing done by a volunteer at work
- Part 3- Life style coaching service.

Part 1 will consist of three education sessions that will be run during work time. Each session will take about 30 minutes. The sessions will be fun and interesting and have been designed to teach you about how you can take up a healthy lifestyle. There will be three talks by health professionals about healthy lifestyle, diet and exercise. It is important that you attend each of the sessions so that you get the benefits of the education.

You will be asked to complete a short survey at the beginning of the session. You will be given a number code to replace your name to ensure your personal details and any information you provide will remain anonymous. None of the information will be made available to anyone else apart from the researchers. The information you provide will be analysed together with the information from all other participants and the results will be reported as a whole. Information gained from participants will be kept secure in a locked filing cabinet and will be kept for five years from publication of the study findings, according to national regulations. Following this, the information will be destroyed.

You are free to decide whether or not you want to participate in this study. If at any time you wish not to be involved you are free to do so without prejudice and your decision to participate or not will in no way affect your current or future employment with this organisation.

Will I be paid to participate in the study?

You will not be paid to participate in this study and it won't cost you anything to join.

Are there any risks involved?

There are no risks involved with your participation in this project, however if you have any existing health problems or concerns we advise you to see your doctor before starting. If during the project you experience concerns about your health you must contact your doctor or Albany Regional Hospital on phone number 08 98922222.

What if I need more information?

If you have questions about the study at any time you can contact the Researcher, Kristi Holloway (telephone 08 98451716).

Concerns or complaints?

This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number HR 24/2009). The Committee is comprised of members of the public, academics, lawyers, doctors and pastoral carers. Its main role is to protect participants. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or by emailing hrec@curtin.edu.au

Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

THANK YOU FOR CONSIDERING TAKING PART IN THIS PROJECT

CONSENT FORM

Study Title: **Industry “Waist” Disposal Challenge**

PART 1: EDUCATION SESSIONS

Researcher: Kristi Holloway

PhD Student, Western Australian Centre for Cancer and Palliative Care,
Curtin University

Supervisors from Curtin University:

Professor Samar Aoun and Professor Duncan Boldy

- I have been given clear, written information about this research project and have been given time to consider whether or not I wish to take part.
- I understand and accept the nature of the study which has been explained to my satisfaction.
- I know that my participation in this study is strictly voluntary. I know that I have the right to withdraw at any time.
- If I have any questions about the study or about being a participant, I can call Kristi Holloway on (08) 98451716.
- I know that I can contact the Research Ethics Officer at Curtin University on (08) 9266 2784 if I wish to discuss any aspects of the study on a confidential basis.
- I agree to participate in this study. I have been assured that my identity will not be revealed while the study is being conducted or when the study is published or presented at a conference.
- If I am concerned about my health during my participation in this project I will seek medical advice from my doctor or from Albany Regional Hospital on 98922222.

.....
Participant's Name

.....
Participant's Signature

.....
Researcher's Name

.....
Researcher's Signature

Date:

Please keep a copy of this form for your records.

INFORMATION SHEET FOR PARTICIPANTS

Study Title: **Industry “Waist” Disposal Challenge**

PART 2: BMI Challenge

Researcher: Kristi Holloway

PhD Student, Western Australian Centre for Cancer and Palliative Care,
Curtin University

Supervisors from Curtin University:

Professor Samar Aoun and Professor Duncan Boldy

We are running a health program in your workplace. We would like to help you reduce the chance of developing chronic illnesses such as Type II Diabetes and heart disease. The health program has three parts and you are invited to participate in the Part 2:

- Part 1- Education
- **Part 2- Monthly weighing done by a volunteer at work**
- Part 3- Life style coaching service.

Part 2 will involve your participation in a monthly “weigh-in” to work out your Body Mass Index (BMI). BMI is worked out by dividing your weight by your height and then multiplying this figure (squared). People with a BMI of 25 and over are generally considered to be overweight. Part 2 will be a challenge that is open to all male staff employed by [organisation]. Other companies are also participating and each company will enter the challenge. The company that loses the most weight within a year will be the winner and will be given a trophy.

In order to get an accurate BMI of all workers in your company, you will need to be weighed every month. Two volunteers from your work will be responsible for weighing and keeping a monthly record of all weights. Your height will only need to be measured once at the beginning of the challenge period. The volunteers from your work will provide these details to the researcher who will keep the records from all companies and follow their progress.

You will be asked to complete a short survey at the beginning of the challenge and one at the end of the challenge. You will be given a number code to replace your name to ensure your personal details and any information you provide will remain anonymous. None of the information will be made available to anyone else apart from the researchers. The information you provide will be analysed together with the information from all other participants and the results will be reported as a whole. Information gained from participants will be kept secure in a locked filing cabinet and will be kept for five years from publication of the study findings, according to national regulations. Following this, the information will be destroyed.

You are free to decide whether or not you want to participate in this study. If at any time you wish to not to be involved you are free to so without prejudice and your decision to participate or not will in no way affect your current or future employment with this organisation.

Will I be paid to participate in the study?

You will not be paid to participate in this study and it won't cost you anything to join.

Are there any risks involved?

There are no risks involved with your participation in this project, however if you have any existing health problems or concerns we advise you to see your doctor before starting. If during the project you experience concerns about your health you must contact your doctor or Albany Regional Hospital on phone number 08 98922222.

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Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

THANK YOU FOR CONSIDERING TAKING PART IN THIS PROJECT

CONSENT FORM

Study Title: **Industry “Waist” Disposal Challenge**

PART 2: BMI CHALLENGE

Researcher: Kristi Holloway

PhD Student, Western Australian Centre for Cancer and Palliative Care,
Curtin University

Supervisors from Curtin University:

Professor Samar Aoun and Professor Duncan Boldy

- I have been given clear, written information about this research project and have been given time to consider whether or not I wish to take part.
- I understand and accept the nature of the study which has been explained to my satisfaction.
- I know that my participation in this study is strictly voluntary. I know that I have the right to withdraw at any time.
- If I have any questions about the study or about being a participant, I can call Kristi Holloway on (08) 98451716.
- I know that I can contact the Research Ethics Officer at Curtin University on (08) 9266 2784 if I wish to discuss any aspects of the study on a confidential basis.
- I agree to participate in this study. I have been assured that my identity will not be revealed while the study is being conducted or when the study is published or presented at a conference.
- .If I am concerned about my health during my participation in this project I will seek medical advice from my doctor or from Albany Regional Hospital on 98922222.

.....
Participant's Name

.....
Participant's Signature

.....
Researcher's Name

.....
Researcher's Signature

Date:

Please keep a copy of this form for your records.

INFORMATION SHEET FOR PARTICIPANTS

Study Title: **Industry “Waist” Disposal Challenge**

PART 3: LIFESTYLE COACHING

Researcher: Kristi Holloway

PhD Student, Western Australian Centre for Cancer and Palliative Care,
Curtin University

Supervisors from Curtin University:

Professor Samar Aoun and Professor Duncan Boldy

We are running a health program in your workplace. We would like to help you reduce the chance of developing chronic illnesses such as Type II Diabetes and heart disease. The health program has three parts and you are invited to participate in the Part 3:

- Part 1- Education
- Part 2- Monthly weighing done by a volunteer at work
- **Part 3- Life style coaching service.**

You are invited to participate to be involved in Part 3 of this study. This part of the study includes a lifestyle coaching service which is being offered to those with a Body Mass Index (BMI) of 27 and over. A program will be developed especially for you and will be worked out between you and a lifestyle coach. Together you will develop a plan for your weight loss and exercise which is monitored with follow-up sessions. The sessions take place over the phone at a time that suits you. There will be six sessions at no cost to you.

Evaluation of this service will include collecting information from participants at each session. The coach will collect information on the amount of regular physical activity, lifestyle changes and goals achieved.

You will be given a number code to replace your name to ensure your personal details and any information you provide will remain anonymous. None of the information will be made available to anyone else apart from the researchers. The information you provide will be analysed together with the information from all other participants and the results will be reported as a whole. Information gained from participants will be kept secure in a locked filing cabinet and will be kept for five years from publication of the study findings, according to national regulations. Following this, the information will be destroyed.

You are free to decide whether or not you want to participate in this study. If at any time you wish to not to be involved you are free to so without prejudice and your decision to participate or not will in no way affect your current or future employment with this organisation.

Will I be paid to participate in the study?

You will not be paid to participate in this study and it won't cost you anything to join.

Are there any risks involved?

There are no risks involved with your participation in this project, however if you have any existing health problems or concerns we advise you to see your doctor before starting. If during the project you experience concerns about your health you must contact your doctor or Albany Regional Hospital on phone number 08 98922222.

What if I need more information?

If you have questions about the study at any time you can contact the Researcher, Kristi Holloway (telephone 08 98451716).

Concerns or complaints?

This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number HR 24/2009). The Committee is comprised of members of the public, academics, lawyers, doctors and pastoral carers. Its main role is to protect participants. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or by emailing hrec@curtin.edu.au

Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

THANK YOU FOR CONSIDERING TAKING PART IN THIS PROJECT

CONSENT FORM

Study Title: **Industry “Waist” Disposal Challenge**
PART 3: LIFE STYLE COACHING

Researcher: Kristi Holloway

PhD Student, Western Australian Centre for Cancer and Palliative Care,
Curtin University

Supervisors from Curtin University:

Professor Samar Aoun and Professor Duncan Boldy

- I have been given clear, written information about this research project and have been given time to consider whether or not I wish to take part.
- I understand and accept the nature of the study which has been explained to my satisfaction.
- I know that my participation in this study is strictly voluntary. I know that I have the right to withdraw at any time.
- If I have any questions about the study or about being a participant, I can call Kristi Holloway on (08) 98451716.
- I know that I can contact the Research Ethics Officer at Curtin University on (08) 9266 2784 if I wish to discuss any aspects of the study on a confidential basis.
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Participant's Name

.....
Participant's Signature

.....
Researcher's Name

.....
Researcher's Signature

Date:

Please keep a copy of this form for your records.

INFORMATION SHEET FOR PARTICIPANTS

Study Title: **Industry “Waist” Disposal Challenge**

PART 4. INTERVIEW

Researcher: Kristi Holloway

PhD Student, Western Australian Centre for Cancer and Palliative Care,
Curtin University

Supervisors from Curtin University:

Professor Samar Aoun and Professor Duncan Boldy

We have been running a health program in your workplace that is aimed at reducing your chance of getting chronic illness such as Type II Diabetes and heart disease. As part of the health program we are conducting interviews. This invitation is to be involved in an interview.

As you were a participant in this project, we would like to invite you to participate in an informal interview that will take about 15-30 minutes. We would like to hear your experiences with the project and how you are going with taking up a healthy lifestyle. It is hoped that the findings from interviews will help us, to help other people to take up healthy lifestyles.

The interview will be tape recorded and transcribed for the use in the project. All possible attempts will be made to guarantee your confidentiality and anonymity.

You will be given a code to replace your name. Therefore your participation will be anonymous and none of the information will be made available to anyone else. The information you provide will be analysed together with the information from all other participants and the results will be reported as a whole. Information gained from participants will be secured in a locked filing cabinet and will be kept for five years from publication of the study findings, according to national regulations. Following this, the information will be destroyed.

You are free to decide whether or not you want to participate in this study. If at any time you wish to not to be involved you are free to so without prejudice and your decision to participate or not will in no way affect your current or future employment with this organisation.

Will I be paid to participate in the study?

You will not be paid to participate in this study and it won't cost you to join.

Are there any risks involved?

There are no risks involved with your participation in this project, however if you have any existing health problems or concerns we advise you to see your doctor before starting.

What if I need more information?

If you have questions about the study at any time you can contact the Researcher, Kristi Holloway (telephone 08 98451716).

Concerns or complaints?

The ethical aspects of this study have been approved by the Human Research Ethics Committee at Curtin University of Technology. If you have any complaints or questions about any ethical aspect of your participation in this research, you may contact:

Secretary, Human Research Ethics Committee
Office of Research and Development
PO Box U1987
Perth WA 6845
Ph: (08) 9266 2784
email: hrec@curtin.edu.au

Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

THANK YOU FOR CONSIDERING TAKING PART IN THIS PROJECT

CONSENT FORM

Study Title: **Industry “Waist” Disposal Challenge**

PART 4. INTERVIEW

Researcher: Kristi Holloway

PhD Student, Western Australian Centre for Cancer and Palliative Care,
Curtin University

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- I agree to participate in this study. I have been assured that my identity will not be revealed while the study is being conducted or when the study is published.

.....
Participant's Name

.....
Participant's Signature

.....
Researcher's Name

.....
Researcher's Signature

Date:

Please keep a copy of this form for your record.

The Industry 'Waist' Disposal Project

Kristi Holloway
Curtin University
of Technology



Dying of too little food or of too much food!!

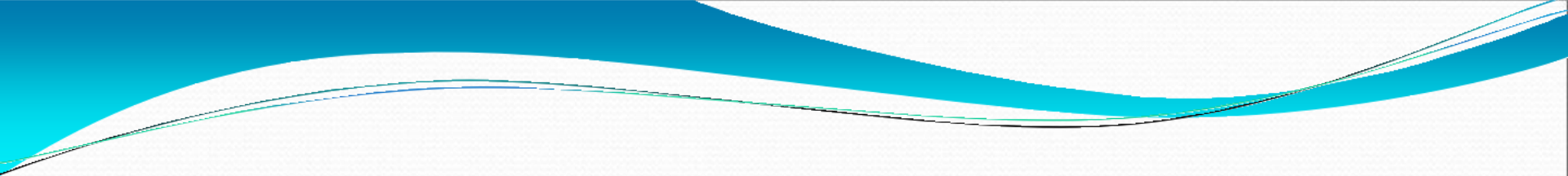


Food expenditure for one week in Chad



Food expenditure for one week in Germany





In 2006, for the first time in world history, more people died from obesity related diseases than from malnutrition

National Crisis

Chronic disease = Global Epidemic

- Largest cause of death world-wide
- Causes more than 70% of loss of health in Australia

Chronic Disease

Most common types of chronic disease are:

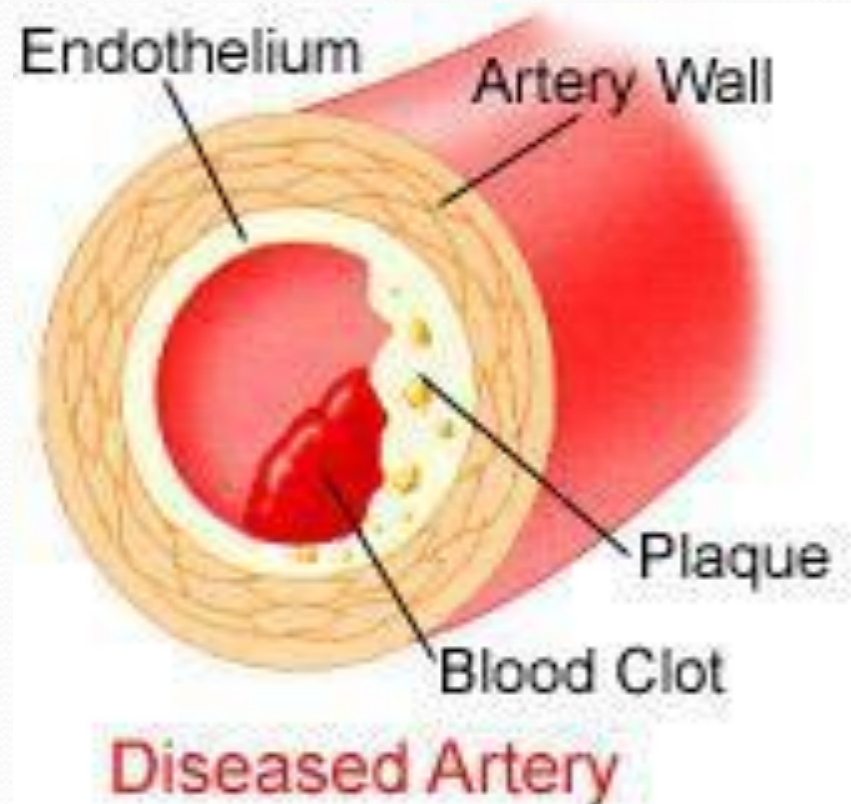
- Cardiovascular disease (clogged arteries, heart failure, high blood pressure and stroke)
- Diabetes
- Some Cancers

*These are mostly lifestyle related and can be prevented!!!

Risk Factors for Chronic Disease

Modifiable:

- Poor diet
- Physical inactivity
- Obesity
- Smoking
- Excess alcohol



Forestry Workforce

- Not much data on forestry workers
- Majority men
- Workers exposed to stress- long working hours, high mental work load and intense work environments
- New Zealand study found that
 - 47% smoked
 - 20% smoked > 20 cigarettes per day
 - 14% reported that alcohol affected their work in some way

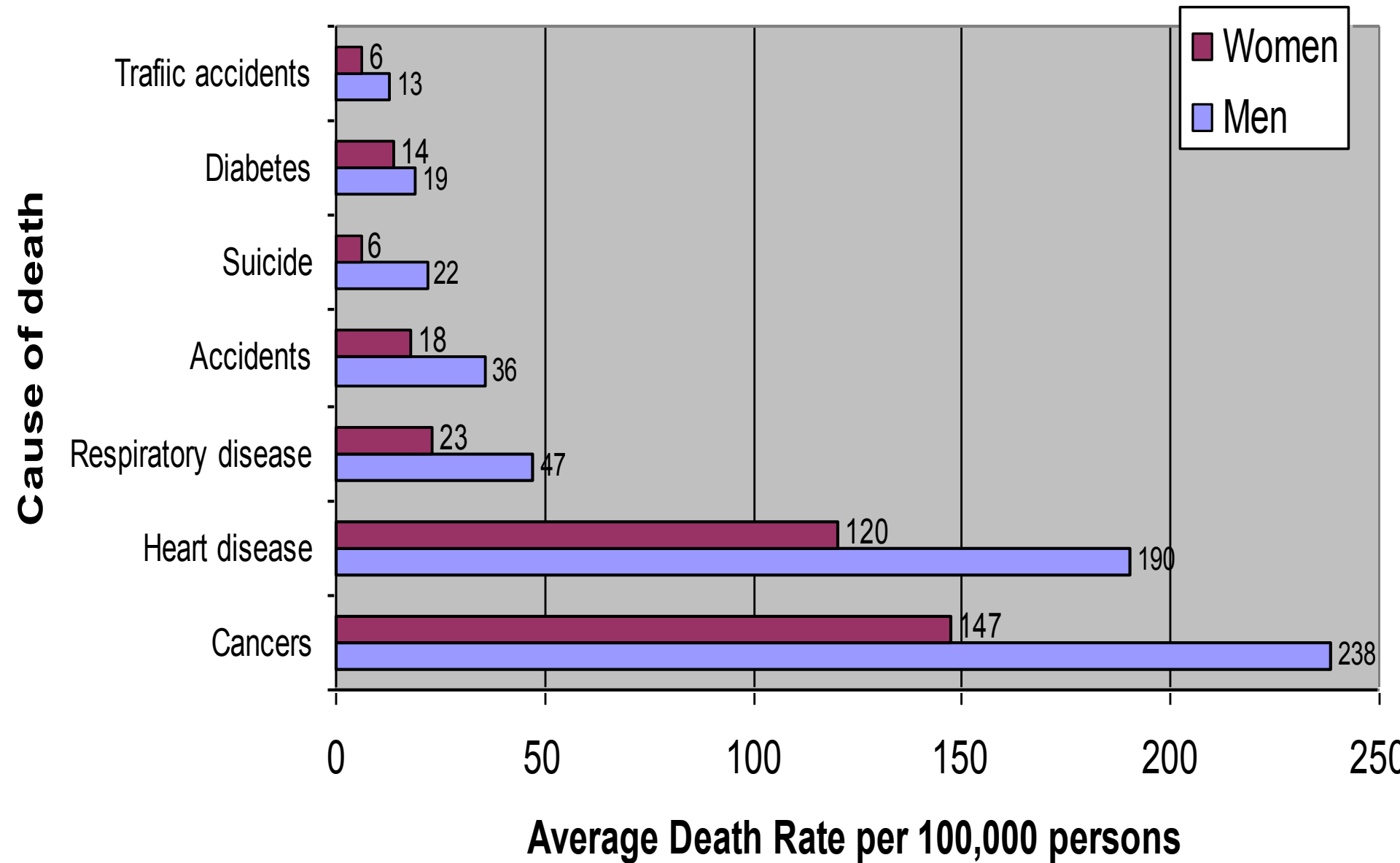
Men's Health

- Particularly at risk of chronic disease
- Men tend to soldier on and be the hero
- Men tend to be reluctant to contact their doctor unless severely unwell
- Damage is done before they seek help

“At 50, you get a wake-up call... you realise you're not bullet-proof”

“Just take a look at who gets on the bus outside old people's homes...75% are women”

Common Causes of Death in Australia



KEEP OFF the Endangered Species List!!



Prevention of Chronic Disease

- Adopting healthy lifestyles
- Reduce modifiable risk factors including
 - Healthy diet
 - Exercise

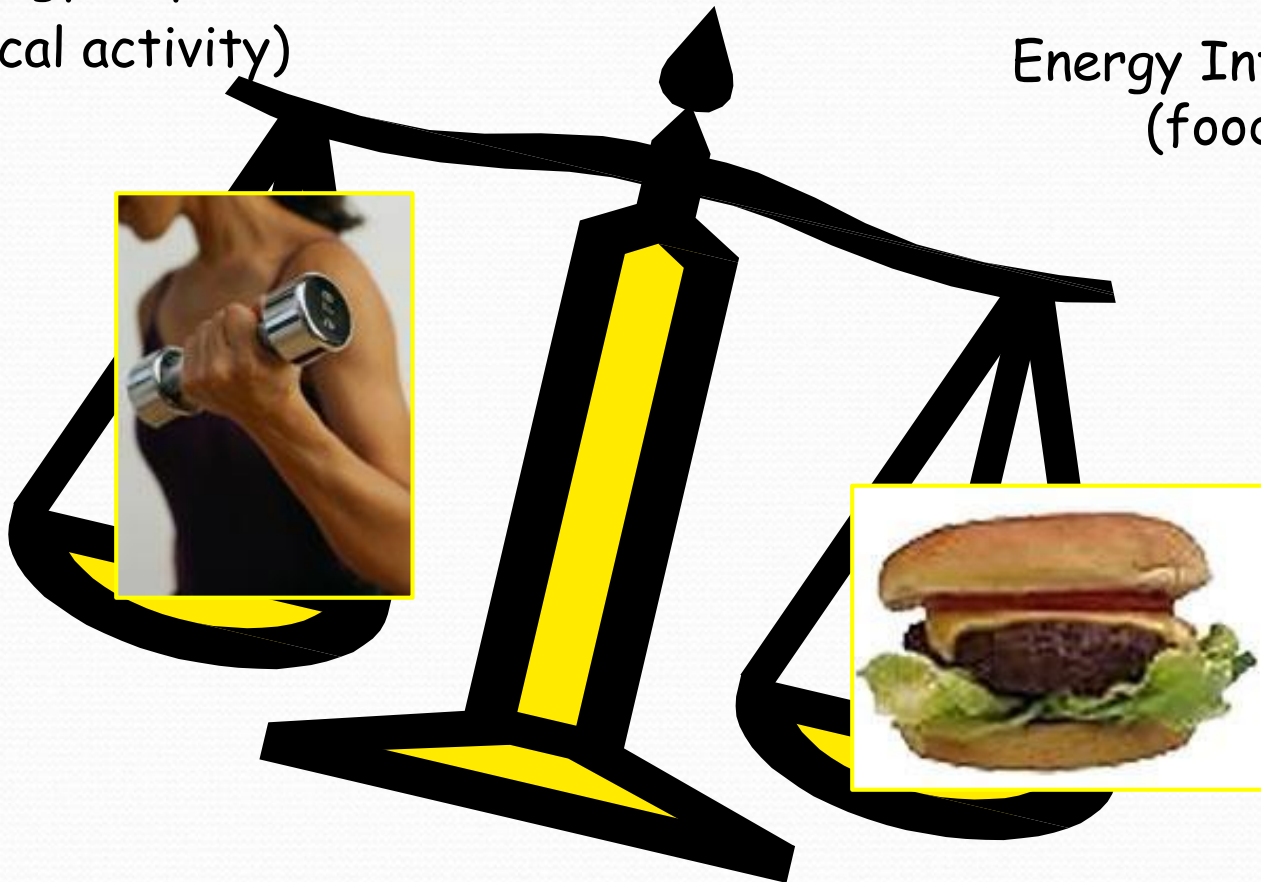
= Chronic Disease Self-Management

Reducing Obesity

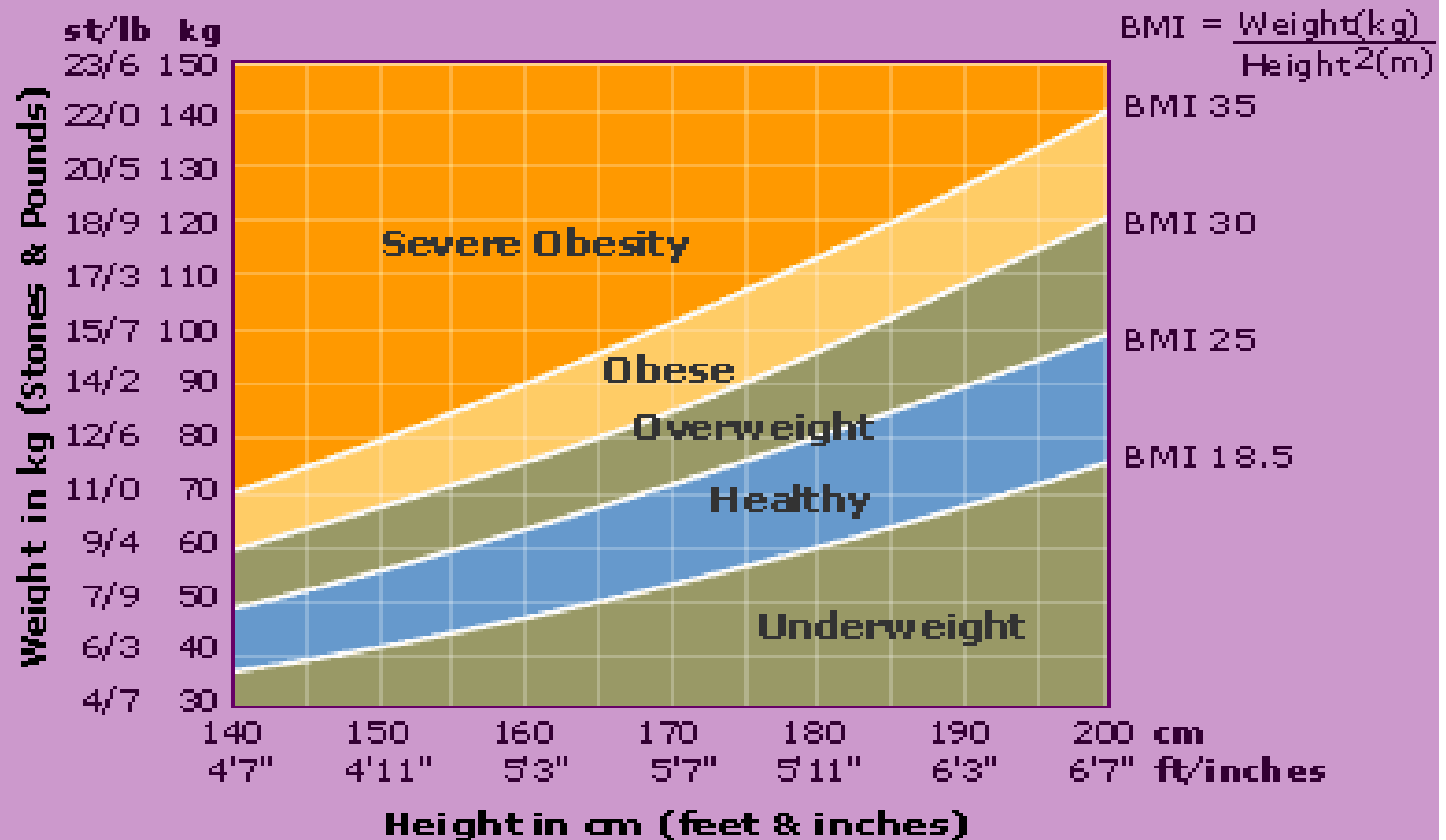
Increase in body weight results from an imbalance between

Energy Expenditure
(physical activity)

Energy Intake
(food)



Is Your Weight Healthy?



Waist Measurements

Measure Up Campaign (Heart Foundation)

What does my waist measurement mean?

Risk of developing a chronic disease

Increased risk

- Men: more than 94 cm
- Women: more than 80 cm

Greatly increased risk

- Men: more than 102 cm
- Women: more than 88 cm

The 'Waste' in the 'Waist'



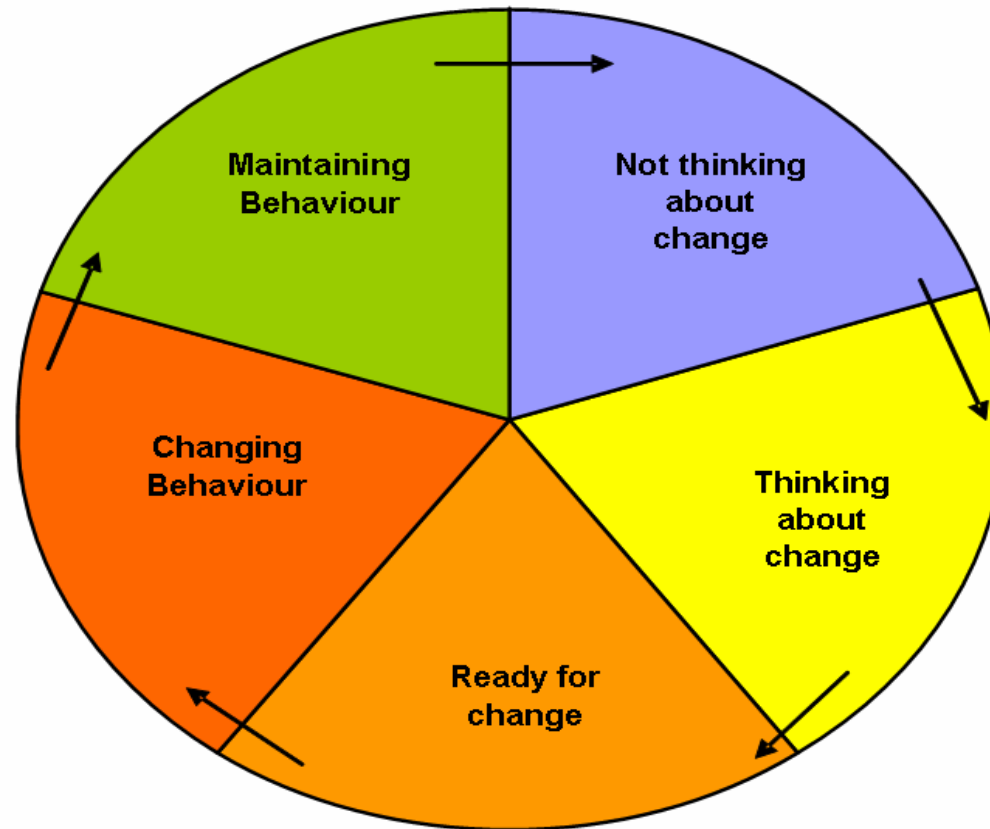
Industry 'Waist' Disposal Project

- Similar project ran with Rotary Clubs in WA (n=750 participants) was very successful
 - ↓ weight
 - ↑ activity + improve diet + other factors
- Industry 'Waist' Disposal Project → the forestry industry in the Great Southern Region of WA
- Key Forestry Organisations participating
 - On farm and off farm (processing)
- Project will run for approximately 18 months

Aims of the 'Waist' Disposal Project

1. Change in weight
2. Changes in
 - Dietary intake
 - Physical activity
- Cholesterol, blood pressure and glucose levels (voluntary basis)

Cycle of Behavioural Change



Industry 'Waist' Disposal Project Phases

- Phase 1: Educational presentations
- Phase 2: Monthly monitoring of BMIs
- Phase 3: Lifestyle coaching service
- With a fourth phase to evaluate



Phase One: Education

Educational presentations of 3 types:

1. Overview of project/chronic disease
2. Nutrition
3. Physical activity

How long to walk it off??

1 Mars Bar 60gm

= 72 mins



1 Sausage

= 85 mins



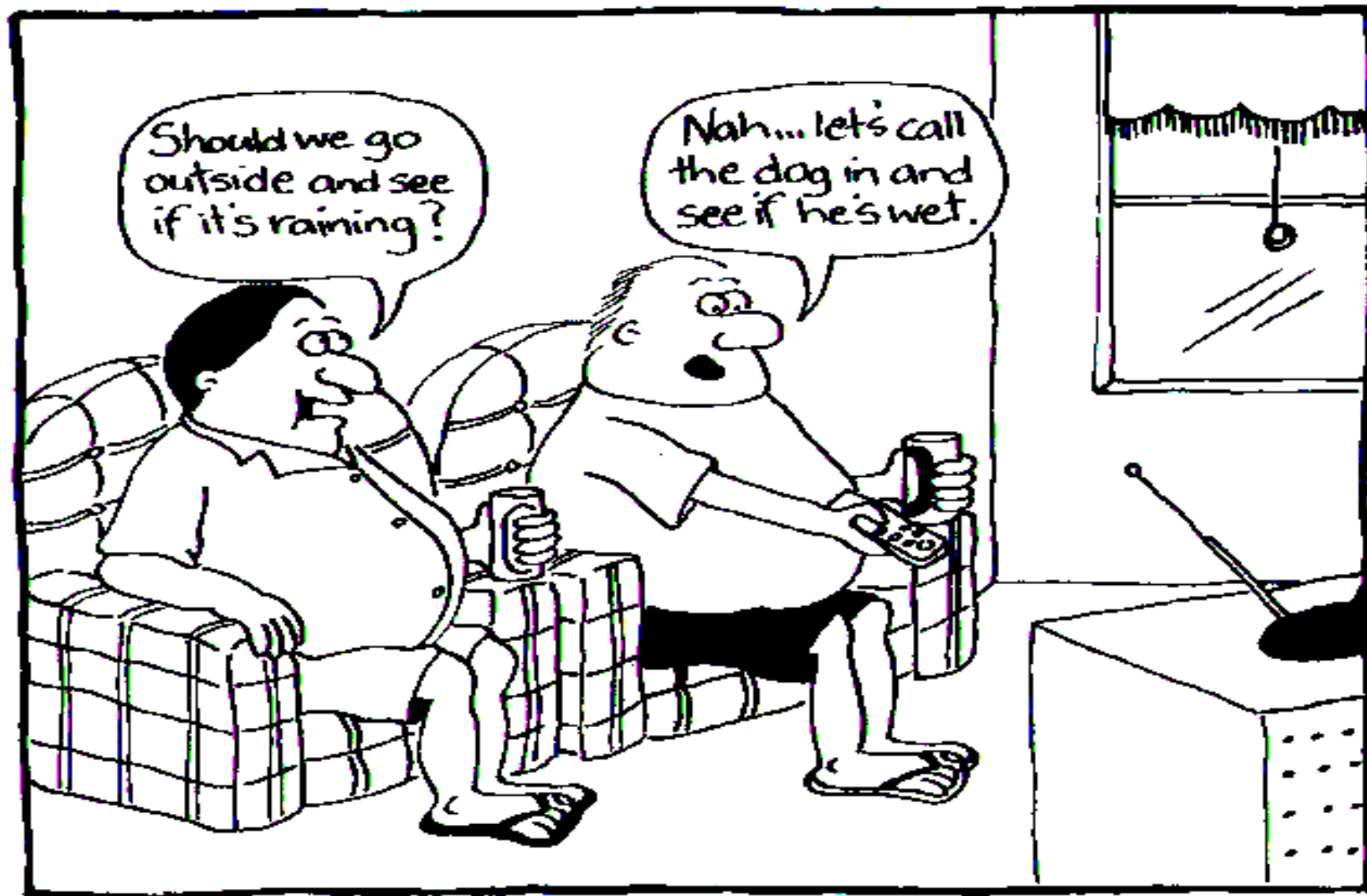
1 Meat Pie

= 125 mins



Proportion of Disease Caused by being INACTIVE

- 18% Heart Disease
- 16% Stroke
- 13% Diabetes II
- 19% Colon Cancer
- 9% Breast Cancer
- 10% Depression



TYPICAL DISCOURSE BETWEEN MEMBERS OF THE HUMAN ENERGY
CONSERVATION SOCIETY.

Phase Two: BMI Competition

- Monthly monitoring of Body Mass Index (BMI)
AIM: Reduce BMIs to below 25
- Average BMI of TEAM will be recorded monthly
- Organisation with the greatest reduction in BMI + other factors will **WIN!!**



Phase 3: Lifestyle Coaching

- A telephone lifestyle coaching program
- Program tailored to participants
- Coaches (health professionals) give skills to achieve health goals
- Monitored at regular intervals

*A fourth phase will be an evaluation of the whole project within the forestry industry- will include interviews with some participants.

Are you going to be a statistic?

- **72%** of middle-aged males and **58%** of middle-aged females are overweight or obese
- Every day in Australia, **242** people are diagnosed with diabetes
- Obese people are **4 times more** likely to develop Diabetes
- **65-80%** of people with diabetes will die of heart disease
- Losing **5Kg in 5 months** can result in **27%** fewer heart disease hospital admissions and **34%** fewer **deaths** in next 20 yrs.

Ending on a positive note!

Overweight men
are more likely to
remain faithful to
their partners!



Are you ready for the Challenge?



Nutrition to Assist Your 'Waist' Disposal



- You are what you eat! -

Ann Heward



Fats in Foods

There are 3 different kinds of fat in the food we eat.

1. Saturated
2. Monounsaturated
3. Polyunsaturated

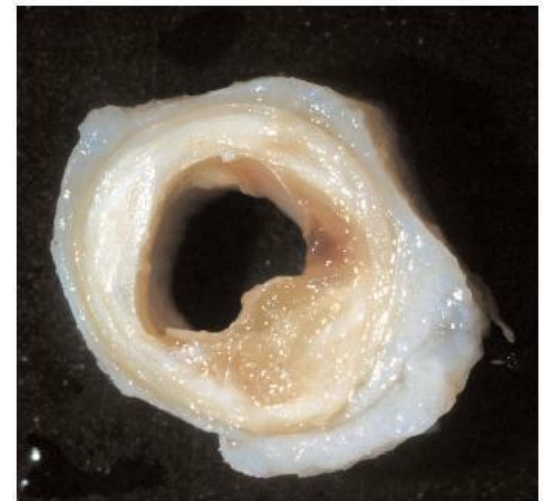
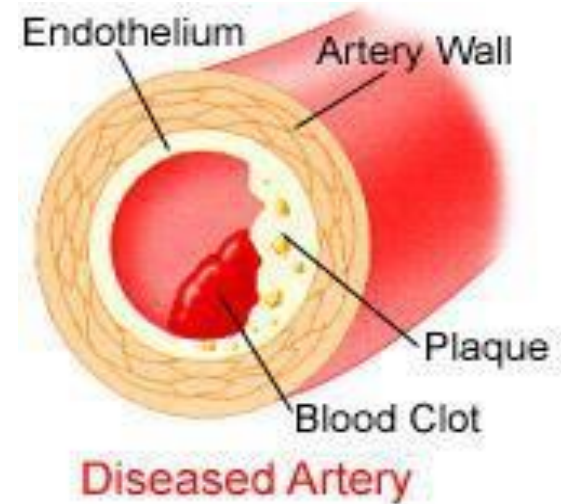
Which fats are higher in energy (kilojoules kJ)?



Saturated fat

NOT GOOD FOR YOU!

- Hard at room temperature
- Animal foods (milk/dairy)
- Coconut and palm oil



Mono and Poly Unsaturated Fats

GOOD FOR YOU!

- Mono-Unsaturated Fats -
canola, olive or peanut oil,
avocado, nuts (cashews,
peanuts, almonds, hazelnuts)
- Polyunsaturated Fats -
fish, seafood, nuts (walnuts,
seeds, brazil nuts),
vegetable oils

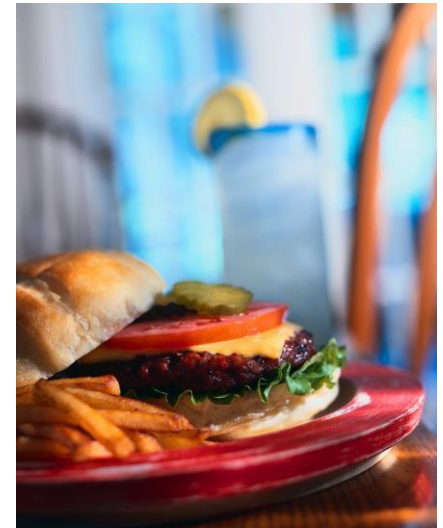


Fat - How much is too much?

Consider **QUANTITY** of fat

- * limit the spread & pouring the oil
- * lean and low fat meat & dairy
- * hidden in cakes, biscuits, pastries
- * read food labels

Consider **QUALITY** of fat



Fibre

Fibre is made up of indigestible parts that pass through body

Benefits=

- Healthy digestive system
- Stable sugar & cholesterol levels
- Prevention of illness eg;
constipation, irritable bowel
syndrome, diverticulitis,
heart disease, some cancers.



Fibre

Where can you get fibre?

Fruit, Vegetables, Breads, Nuts & Wholegrains

How much is enough fibre?

30 grams per day

How much total fibre per 100g?

- > 1g
- > 2g
- > 3g



Food Labels

Food labels are a good way to make healthier choices.



ART - DAN BERGER - CONCEPT - MIKE ADAMS

www.NewsTarget.com

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Food Labels

What should you be
looking for?

How much Fat is too much?
How much Fibre is enough?

NUTRITION INFORMATION

Servings per package: 8

Serving size: 20 g (1 bar)

	Quantity per serving	Quantity per 100g
Energy	350 kJ	1770 kJ
Protein	1.5 g	7.7 g
Fat, total	2.1 g	10.4 g
— saturated	0.3 g	1.4 g
Carbohydrates	14.2 g	70.8 g
— sugars	4.5 g	22.7 g
Sodium	60 mg	305 mg
Dietary fibre	1.2 g	6.0 g

Contains oats, wheat and soy as indicated in bold type.

Ingredients: rolled **oats**, sugar, puffed rice, **wheat**, apricot pieces (8%) [sugar, water, apricot concentrate, dextrose, colour (160(b)), vegetable gum (401), food acid (331), flavour, preservative (202)], glucose syrup, vegetable oil, tapioca starch, salt, emulsifier (**soy** lecithin), flavour.

Product processed on a line that also processes products containing tree nuts.

Alcohol

- Alcohol contains sugar= calories
- No extra nutrients
- Stimulates appetite

Which of these drinks contain 600 kJ or the equivalent of 2 slices of bread?

1. stubby full strength beer,
2. flute glass of bubbly
3. glass of red or white wine,
4. double nip of scotch and soda



Tall glass
of cordial



1 Stubby beer

150 mL Glass
of wine

**All drinks contain approx.
600 kJ**



150 mL Glass
bubbly



Spirits - double

Don't forget to count
what you drink, as
well as what you are
eating with it!

Water

If you have a thirst you are already dehydrated!

Symptoms of dehydration

- tiredness, headache, stress, concentrated urine, mood swings, confusion, dry skin

Reasons to drink water

- Body needs water (65-70% made of water)
- Cheap
- Regulate appetite
- Increase metabolism
- NO calories

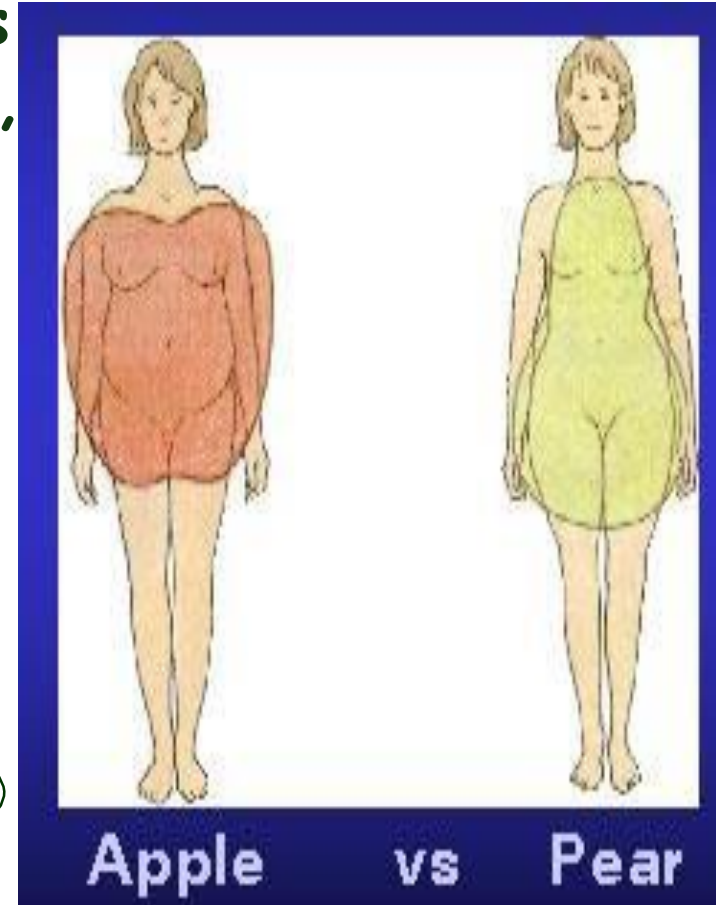


Fat Distribution

Which distribution of fat increases risk for heart disease, diabetes, stroke?

- a. Fat around the waist (apple shape)
- b. Fat around the bottom, hips & thighs (pear shape)

Do you have a waist overhang that a rock climber would find a challenge!

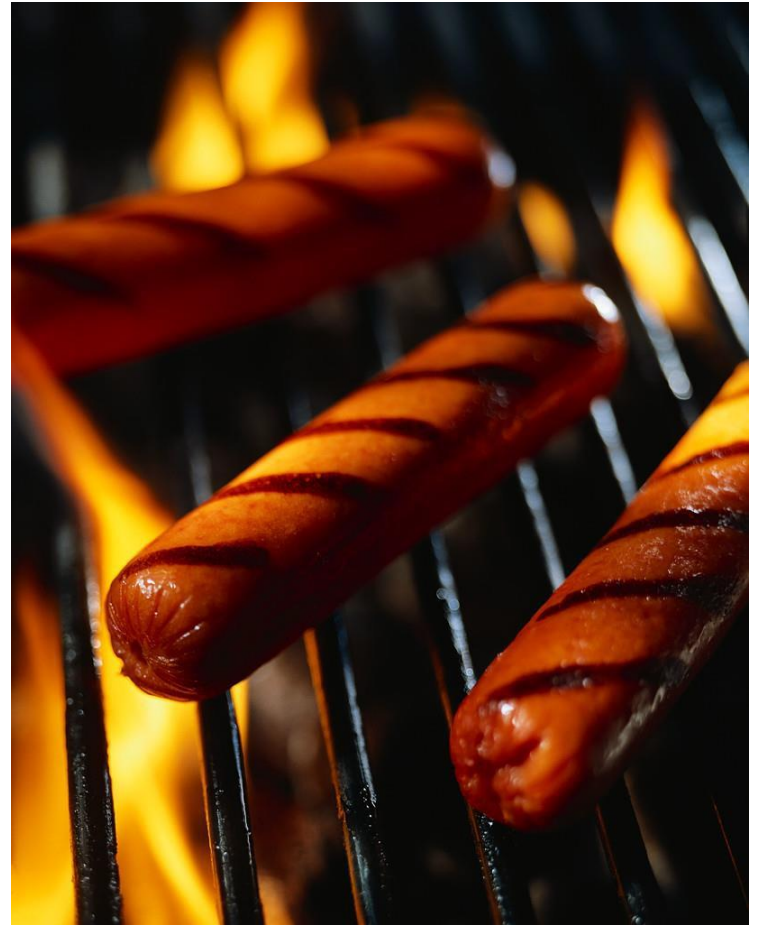


Food Choices

At a BBQ you ate 2 sausages & 2 lamb chops.

How many teaspoons of fat was in this meal?

- 10 teaspoons
- 15 teaspoons
- 20 teaspoons



How long to walk it off??

2 Sausages - 85 mins

- 5 teaspoons of fat (925kJ)



2 Chops - 170 mins

- 10 teaspoons of fat (1850kJ)



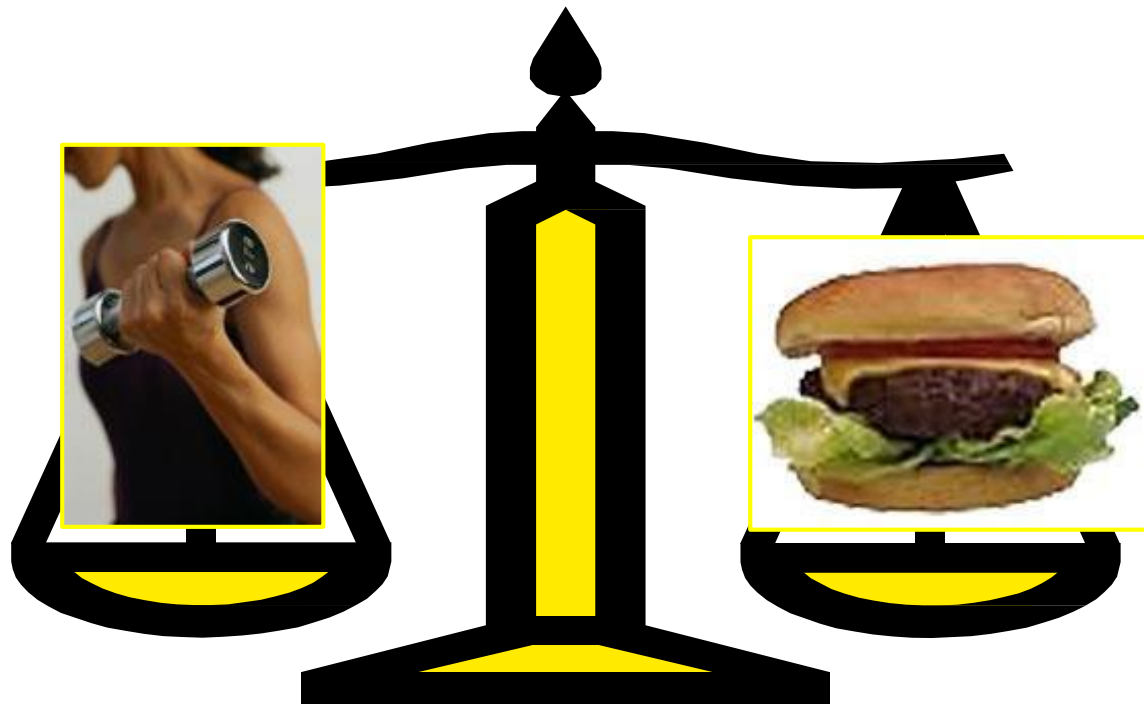
Set a REALISTIC Weight or Fat Loss Goal

- Think of your current weight
- Less 5 - 10% or 5 - 10 kg
- Significantly reduces:
 - Fasting blood sugar (by 50%)
 - decrease bad & increase good cholesterol
 - decrease your mortality 20 - 40%+ (overall & from diabetes & obesity related cancer deaths)
 - Decrease blood pressure (10 - 20 mmHg systolic/diastolic)



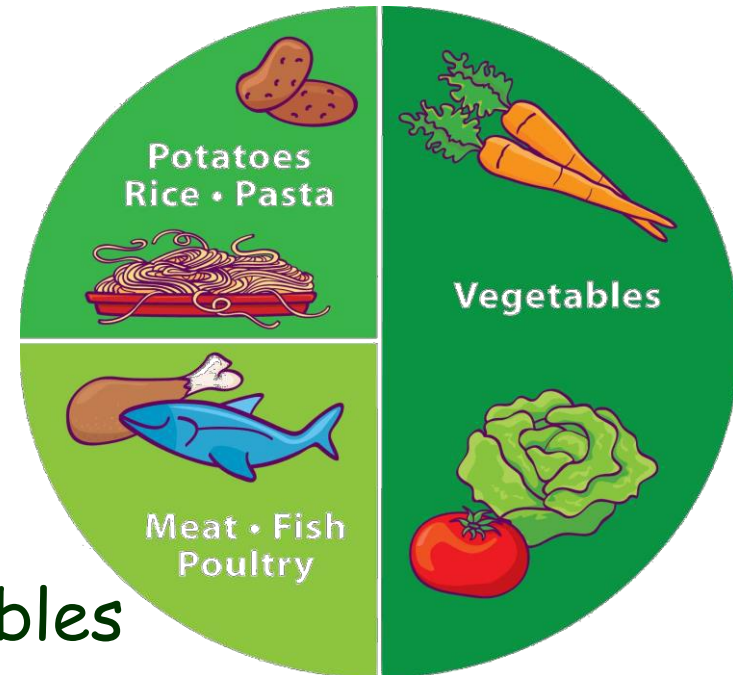
To Lose Weight

Kilojoules Burnt > Kilojoules Eaten



Get Started!

- ✓ Aim to lose 7% of your body weight over 6 months
- ✓ Read food labels
- ✓ Start by serving
 - $\frac{1}{2}$ your plate with salad/vegetables
 - $\frac{1}{4}$ plate with red/white meat
 - $\frac{1}{4}$ plate starchy foods (rice/pasta/potato)
- ✓ Eat smaller portions & regular meals



Are you ready for The Challenge?



Exercise to Assist Your 'Waist' Disposal

– Move It, OR Lose It! –



Tyler Quinn



Source: Aoun, S., Collins, F., Newton, R., Heron, J., Mc Faull, S., & Le, L. (2009). *'Waist' disposal training program for Rotary champions: Champion's resource folder*. Perth, WA: Curtin University.

Let's Get MOVING!



Australia is the World's **FATTEST** Nation





Why Exercise?

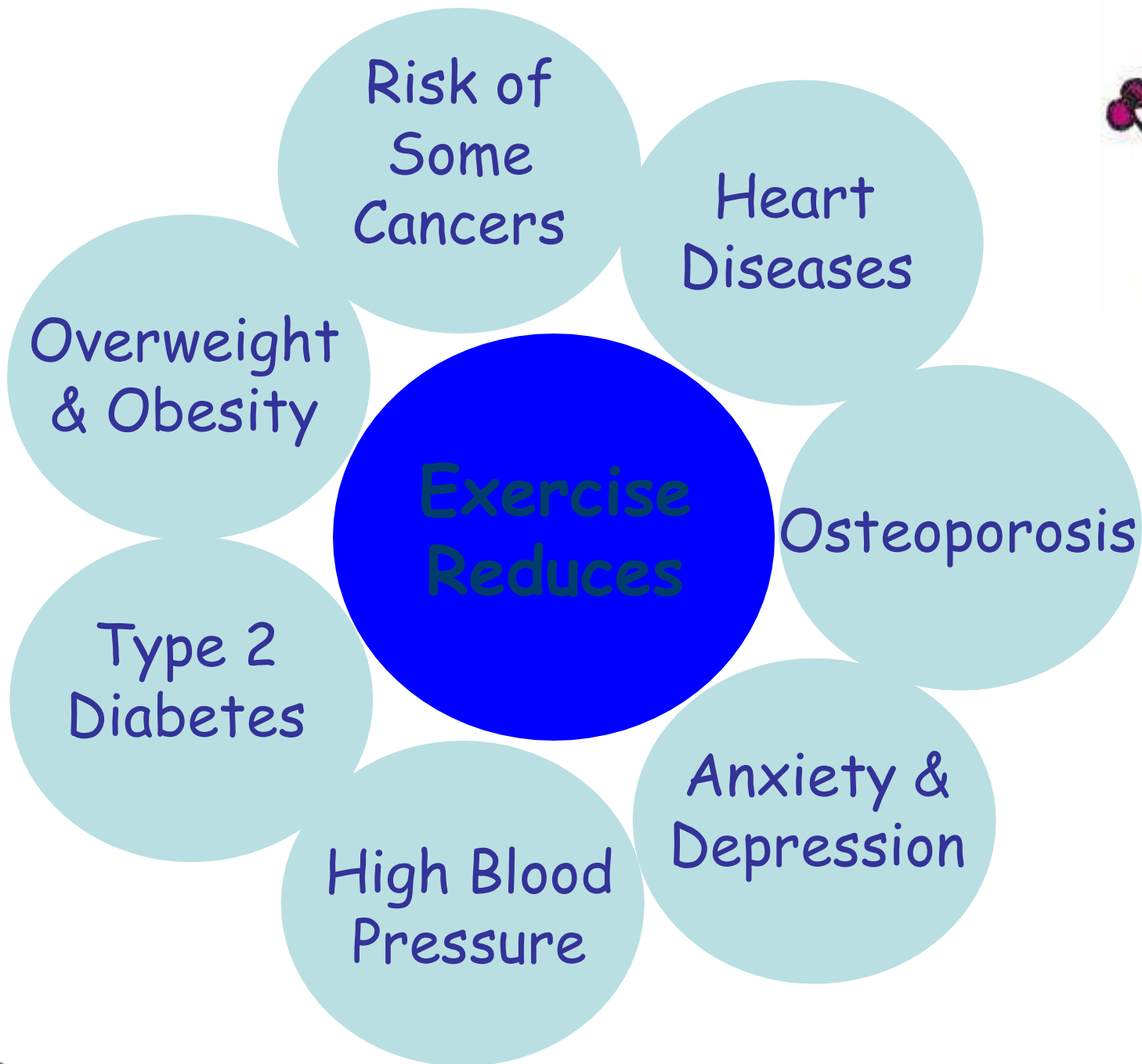
- Two thirds of Australian's are overweight
- Chronic diseases cause more than 70% of loss of health and injury in Australians.
- A key risk factor for chronic disease is lack of physical activity



Major Chronic Diseases

- Cardiovascular disease (atherosclerosis, heart failure, hypertension and stroke)
- Obesity
- Type 2 Diabetes
- Some Cancers
- Osteoporosis and osteoarthritis

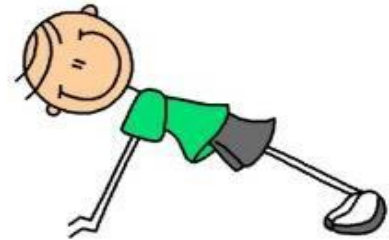




Risk Factors and Lifestyle

If the risk factors for chronic disease were eliminated:

- 80% of heart disease, stroke, and type 2 diabetes would be prevented
- 40% of cancer would be prevented



No Magic Simple Formula

Not happy with your weight and size?



Food Intake



Energy Output



Physical Activity Guidelines

- At least 30 minutes of moderate-intensity physical activity a day
- Accumulative physical activity
 - 3 x 10 minutes
 - 2 x 15 minutes
 - 1 x 30 minutes



Training Heart Rate



- Training Heart Rate (THR) is:
- Maximum Heart Rate (HRmax) X selected % exercise intensity
- $HR_{max} = 207 - (\text{age} \times 0.7)$
- HR can be measured by taking the pulse at the wrist or neck



Types of Exercise

- **Aerobic**
 - Brisk walking, cycling, swimming, dancing, gardening
- **Anabolic (anaerobic)**
 - Resistance (weight) training, squats, push-ups
- **Flexibility**
 - Stretching



Preferably all 3 types should be undertaken each week.

Aerobic Exercise

- Emphasises cardio-respiratory system
 - Improves oxygen consumption
 - Increases heart rate
- Longer duration exercise involving large muscle groups in repetitive actions
- 3 - 4 times per week
 - Improves fitness, mental health, general well-being



Anabolic Exercise

- Repetitive movements performed against resistance
 - Prevents loss of muscle mass and function
 - Improves gait and balance
 - Reduces risk of falling
- 2 - 3 times per week



Flexibility

- Stretching (after warming up)
- 10 - 15 minutes
- Preferably every day
- Hold static stretch for 20 - 60 seconds
 - Improves flexibility
 - Stretches muscles and connective tissues



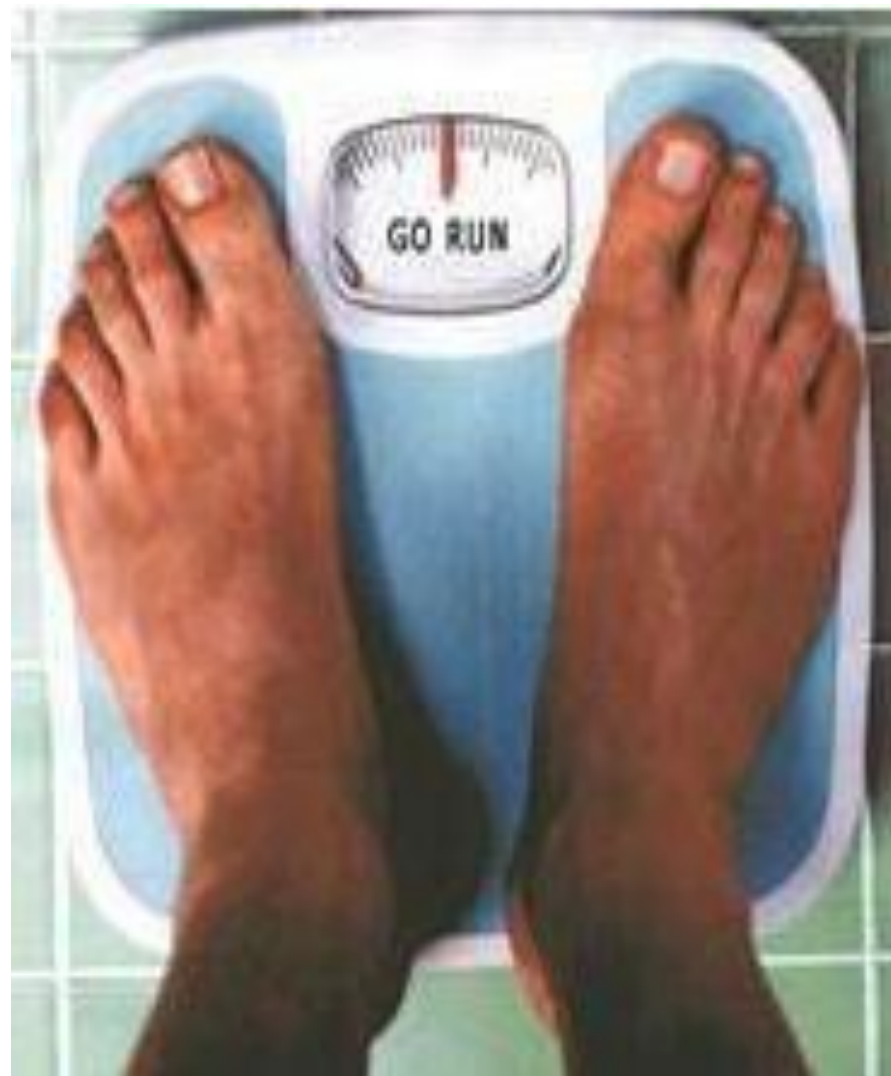
Cut out the Conveniences- Get Started!





Getting Started!

- See your doctor
- Set **SMART** Goals
 - Specific
 - Measurable
 - Achievable
 - Realistic
 - Timely
- Make a plan
- **STICK TO IT!**



Staying Motivated



- Choose activities you enjoy
- Go somewhere convenient
- Start small
- Remember your goals
- Go with a friend or family member
- Start a walking group
- Reward your efforts
- Get a pet
- Monitor your progress
- Join a group activity
- Avoid getting bored with the same routine
- Use a pedometer
- Think of exercise as a convenience
- Exercise with others!

Overcoming Setbacks

- **Time** – Break down your 30 minutes into smaller time slots, schedule exercise in your diary
- **Holiday** – Use your hotel facilities, tour on foot, do more activities that require movement
- **Illness** – Opt for a more gentle exercise routine
- **Injury** – Set new short term goals, focus on getting better
- **Bad weather** – Exercise indoors, use exercise DVD's
- **Failed in the past** – Reassess your goals,
• were they too ambitious?



Are you ready for The Challenge?



Name _____



INDUSTRY “WAIST” DISPOSAL PROJECT

Life-style Survey

ID

1. What is your age? (years)
2. Are you: ☐ Male ☐ Female
3. What is your occupation? _____
4. What is your marital status? ☐ Single ☐ Defacto ☐ Married ☐ Divorced
5. Do you have medical condition?
 - Yes ☐ (please write condition) _____
 - No ☐
 - Don't Know ☐
6. Are you on any medication?
 - Yes ☐ If yes, what is it for _____
 - No ☐
 - Don't Know ☐
7. Do you drink alcohol?
 - Yes ☐ If Yes, how many standard drinks per week _____
(1 standard drink = 30ml (nip) spirits or 120 ml white/ red wine or middy full strength beer)
 - No ☐
8. Do you currently smoke cigarettes, cigars, pipe or other tobacco products?
 - Yes ☐ If Yes, how many per week _____
 - No ☐

Diet (please tick (✓) the most appropriate answer)

9. Which statement below best describes you:

- I am not thinking about losing weight ☐
I am thinking about losing weight, but not in the next fortnight or so ☐
I am thinking about losing weight, in the next fortnight or so ☐
I am trying to lose weight at the moment ☐
I have achieved my weight loss goal ☐

10. Which statement below best describes you:

- I am not thinking about eating less fat ☐
I am thinking about eating less fat, but not in the next fortnight or so ☐
I am thinking about eating less fat, in the next fortnight or so ☐
I am trying to eat less fat at the moment ☐
I have achieved my goal for eating less fat ☐

11. For each question, please choose the statement which best describes your diet.

(For each, please tick (✓) the most appropriate response)

A. How many days a week do you eat 2 or more pieces of fruit?

Never ☐ Less than 1 day ☐ 1-2 days ☐ 3-5 days ☐ 6 or more days ☐

B. How many servings of vegetables do you eat in a typical day?

(1 serve = 1 medium potato or ½ cup of vegetables or 1 cup of salad)?

None ☐ Less than 1 serve ☐ 1 or 2 serves ☐ 3 or 4 serves ☐ 5 or more serves ☐

C. How often do you choose lean cuts of meat, trim all the fat off or remove the skin from chicken you eat?

Never ☐ Rarely ☐ Occasionally ☐ Usually ☐ Always ☐ I don't eat meat ☐

D. How many days a week do you eat take-away or fried foods such as chips, burgers, fried chicken, pies, pizza or Chinese?

6 or more days ☐ 3-5 days ☐ 1-2 days ☐ Less than 1 day ☐ Never ☐

E. How often do you use fat, butter, margarine or oil when cooking, or spreading on bread or crackers?

Always ☐ Usually ☐ Occasionally ☐ Rarely ☐ Never ☐

F. How often do you choose wholemeal/ wholegrain bread, rice, breakfast cereal, crackers or pasta?

Never ☐ Rarely ☐ Occasionally ☐ Usually ☐ Always ☐ I don't eat pasta ☐

G. How many days a week do you eat legumes (e.g. baked beans, lentils, split peas)?

Never ☐ Less than week ☐ Once a week ☐ 2 or 3 days ☐ 4 or more days ☐

H. How often do you choose low-fat dairy or soy including milk, yoghurt or cheese?

Never ☐ Rarely ☐ Occasionally ☐ Usually ☐ Always ☐ I don't drink milk ☐

I. How many days a week do you eat processed meat such as ham, salami or bacon?

4 or more days ☐ 2 or 3 days ☐ Once a week ☐ Less than weekly ☐ Never ☐

Source: Adapted from Wright, J.L., & Scott, J.A. (2000) The Fat and Fibre Barometer, a short food behaviour questionnaire: reliability, relative validity and utility, *Australian Journal of Nutrition & Dietetics*, 57(1), pp. 33–39.

Physical Activity (please tick (✓) the most appropriate answer)

12. Which statement below best describes you:

I am not thinking about increasing the amount of exercise I do

I am thinking about increasing the amount of exercise I do, but not in the next fortnight or so

I am thinking about increasing the amount of exercise I do, in the next fortnight or so

I am trying to increasing the amount of exercise I do at the moment

I am exercising regularly

☐
☐
☐
☐
☐

The next questions are about any physical activities that you may have done in the last week:

13. In the last week, have you walked continuously, for at least 10 minutes, for recreation/ exercise or to get to and from places?

Yes ☐ **On how many days per week?** _____

No ☐ *If No, go to question 15*

14. What do you estimate was the total time that you spent walking in this way, in the last week?

Total time walking: _____ Hours _____ Minutes

15. In the last week, did you do any vigorous gardening or heavy work around the yard which made you breathe harder or puff and pant?

Yes ☐ **On how many days per week?** _____

No ☐ *If No, go to question 17*

16. What do you estimate was the total time that you spent doing vigorous gardening or heavy work around the yard in the last week?

Total time in gardening/yard work: _____ Hours _____ Minutes

Note: The next question excludes household chores, gardening or yard work

17. In the last week, did you do any vigorous physical activity that made you breathe harder or puff and pant? (e.g. jogging, cycling, aerobics, competitive tennis)

Yes ☐ **On how many days per week?** _____

No ☐ *If No, go to question 19*

18. What do you estimate was the total time that you spent doing this vigorous physical activity in the last week?

Total time in vigorous physical activity: _____ Hours _____ Minutes

19. In the last week, did you do any other more moderate physical activities that you have not already mentioned? (e.g. gentle swimming, social tennis, golf)

Yes ☐ **On how many days per week?** _____

No ☐ *If No, go to question 20*

Source: Adapted from Australian Institute of Health & Welfare (2003). The active Australia survey: A guide and manual for implementing, analyzing and reporting. Canberra: AIHW.

Motivation for lifestyle change

20. Rate how confident you are that you could really motivate yourself to do things like these regularly, *for at least six months*:

(1 =not confident - 5 = very confident)

DIET & EXERCISE	I Know I Cannot					I Know I Can	Does Not Apply
A. Stick to your low fat, low salt foods.	1	2	3	4	5		6
B. Eat smaller portions	1	2	3	4	5		6
C. Eat lunch as your main meal of the day, rather than dinner.	1	2	3	4	5		6
D. Eat salads for lunch.	1	2	3	4	5		6
E. Eat low salt foods.	1	2	3	4	5		6
F. Eat vegetarian entrees for dinner.	1	2	3	4	5		6
G. Substitute low or non-fat milk for whole milk at dinner.	1	2	3	4	5		6
H. Cut down on gravies and cream sauce.	1	2	3	4	5		6
I. Get up early, even on weekends, to exercise.	1	2	3	4	5		6
J. Stick to your exercise program when you are tired or stressed.	1	2	3	4	5		6
K. Do a physical activity program of continuous activities for at least 30 minutes, 3 times per week.	1	2	3	4	5		6
L. Continue to exercise with others even though they seem too fast or too slow for you.	1	2	3	4	5		6
M. Stick to your exercise program when you have other family or household jobs to do.	1	2	3	4	5		6
N. Stick to your exercise program even when you have excessive demands at work.	1	2	3	4	5		6
O. Stick to your exercise program when social obligations are very time consuming.	1	2	3	4	5		6
P. Read or study less in order to exercise more.	1	2	3	4	5		6

Source: Adapted from Sallis, J.F., Pinski, R.B., Grossman, R.M., Patterson, T.L., & Nader, P.R. (1988). The development of self-efficacy scales for health-related diet and exercise behaviors. *Health Education Research*, 3, 283-292.

You have finished the questionnaire!

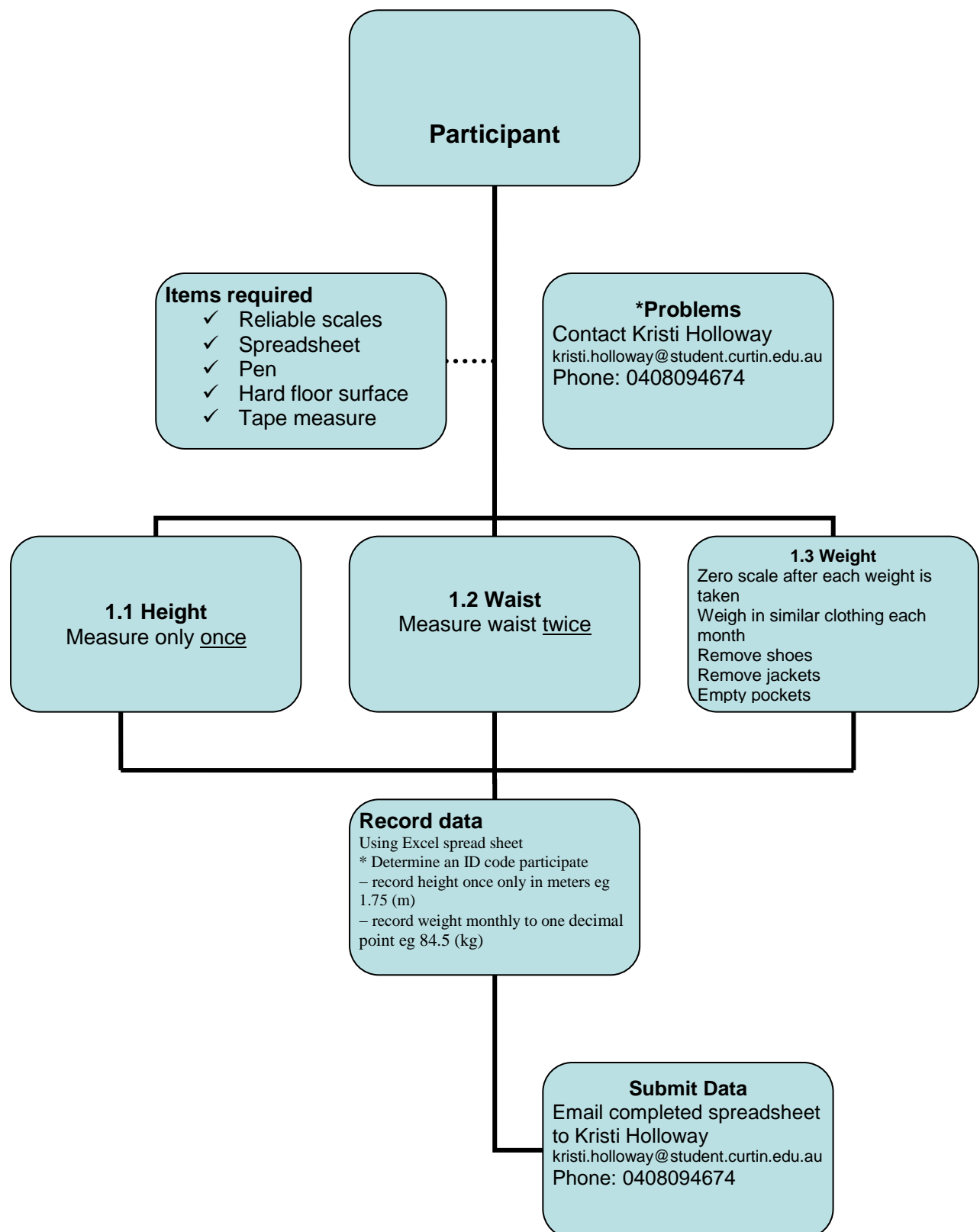
Please ensure you have answered all the questions and then return your questionnaire to the allocated box in your workplace.

THANK YOU VERY MUCH FOR YOUR CO-OPERATION

Industry Waist Diposal Project																															
Oraganisation:																															
Club Champion:																															
Name	ID	Comment	Height (m)	Waist (cm)	Jan	BMI	Feb	BMI	Mar	BMI	Waist (cm)	Apr	BMI	May	BMI	Jun	BMI	Waist (cm)	Jul	BMI	Aug	BMI	Sep	BMI	Waist (cm)	Oct	BMI	Nov	BMI	Dec	BMI
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Adapted from: Aoun, S., Collins, F., Newton, R., Heron, J., Mc Faull, S., & Le, L. (2009). *'Waist' disposal training program for Rotary champions: Champion's resource folder*. Perth, WA: Curtin University.

Industry Waist Disposal Project Protocol for measuring



1.1 Procedure for measuring height

Equipment required: tape measure and square or ruler.

1. Participant to remove shoes, heavy clothing, hats, and thick socks.
2. Undo hairstyles that interfere with measurements.
3. Participant to stand with back and feet against wall on a flat surface. The measuring tape should run down the center of participant's back.
4. Weight should be evenly distributed, shoulders relaxed, legs straight, arms at side, and buttocks and shoulders should touch the wall.
5. Make sure that the head is in a horizontal position, with the lower margin of the eye socket (Orbital) in line with the middle of the ear (Tragion).
6. Have participant look ahead and inhale deeply without allowing heels to rise off floor.
7. Place square/ruler against wall and lower it until the square firmly touches the crown of the participant's head.
8. Hold square/ruler while participant remains in position and record measure before participant exhales.
9. At eye level, record the measurement at the lower edge of square and measuring tape. Record to the nearest millimetre.

1.2 Procedure for measuring waist girth

Equipment required: tape measure. If a plastic or cloth tape is used, it should be checked regularly against a metal tape as it may stretch over time.

1. Have participants remove coat/jumper, loosen belt and if appropriate, lift shirt.
2. Pass the tape measure around the participants middle making sure the tape is not too tight or too loose and is lying flat on the skin.
3. Ask the participant to relax and breathe naturally.
4. Measure the waist circumference at the narrowest waist level, this is in a horizontal plane usually passing through the belly button. If this is not easy to determine, at the mid point between the lowest rib and the top of the hip bone (iliac crest).
5. Aim: the purpose of determining waist girth is to gain a measure of the amount of abdominal fat (visceral fat), which has been linked to increased risk of coronary heart disease and diabetes.

1.3 Procedure for measuring weight

Equipment required: reliable scales, flat and solid surface to weigh secure scales

1. Have participants remove shoes, coats/ heavy vests, empty out heavy items in pockets remove heavy jewellery etc. Try to wear similar clothing for each monthly weigh in, preferably light clothing.
3. Ask the participant to relax and breathe naturally.
4. Record the weight in kilograms. Rounding to the nearest one decimal.

Appendix G. Resources Supplied to Champions

Resources	
1.	'Better health' fact sheets
2.	Health related scholarly articles
3.	Health related weblinks
4.	Healthy recipes
5.	Simple exercise or physical activity ideas
6.	Holiday health ideas for healthy diet and physical activity
7.	Cancer Council WA resources including posters, pamphlets, and stickers
8.	Healthy food, exercise posters received from Australian Government health campaigns
9.	Men's Health pamphlets
10.	Men's ehealth newsletters
11.	Measure-up campaign material
12.	"Swap-it" campaign material
13.	Diabetes WA "Get on Track" material
14.	Pilates DVDs
15.	You-tube motivational videos

LEVEL 3- LIFESTYLE COACHING INTERVIEW PROTOCOL

Primary Outcome: Weight loss (indicated by a reduction in BMI)

Criteria for entry into level 3:

1. Participant has a BMI = or >27
2. Participant has completed a consent form to participate in level 3
3. Participant has completed level 3 baseline evaluation questionnaire

People Involved

Research Staff
Lifestyle coach
Participant consenting to participate in level 3

Research Staff Role

- ✓ Support staff to post out the level 3 questionnaire to Champions who will then distribute to participants with a BMI \geq 27.
- ✓ Participants to post completed questionnaire back in reply paid envelope for data entry by research staff.
- ✓ Copy of questionnaire is posted to Coach.

Phone coaching overview

Introduction (Participant to be phoned by Coach 1 – 2 days after consent form received)

1. Establish rapport with participant.
2. Explain phone coaching process i.e.
 - contact at baseline, 1, 3, 5 months;
 - ask time and day most suitable to phone;
 - reminder of next phone contact to be included in coaching contract
3. Coach to review questionnaire and encourage participant to visit doctor to provide clearance for involvement in physical activity plus to take biochemical measures i.e. blood lipids, blood pressure, fasting blood glucose if they have not done so – however if it is difficult to get this data, do not discourage participant from participating.

Baseline (Participant to be phoned within a week of Coach receiving the questionnaire)

1. Prior to telephoning participant review completed evaluation i.e. readiness to change, dietary intake, physical activity, biochemistry (if measured), anthropometric measures (i.e. weight, waist, BMI). This will assist in identifying risk factors and co-morbidities.
2. Re-establish rapport and acknowledge completed evaluation
3. Dependent on stage of change:
 - *Pre-contemplation:* discuss possible benefits of losing weight/body fat

- *Contemplation*: discuss/emphasise possible benefits of change (eg dietary, physical activity). Explore what would need to happen to start preparing for change by identifying and minimising perceived barriers and increasing participant's self confidence
- *Preparation*: Attempt to encourage commitment, goal setting or contracting and provide specific information on diet or/and physical activity changes
- *Action*: Provide encouragement, positive reinforcement and problem solving support. Assess current actions to ensure appropriate way to change weight.
- *Maintenance*: provide suggestions for ongoing support (community links), review progress, positive reinforcement, relapse prevention and reevaluation if diet and physical activity relapses.

**Other items to consider in relation in motivation to change*: previous weight loss attempts, mental health issues, disability issues, social issues, ethnicity

4. Establish/assess Participant's dietary intake and formulate dietary recommendations (refer to completed evaluation)

- food habits and eating attitudes
- cooking methods
- factors contributing to excess energy intake (fat type and quantity)
- alcohol
- *use a record for Participant's treatment history to assist in data collection*
- Discuss participant's dietary goals
- Consider appropriate resources for Participant to support goals

5. Establish/assess Participant's physical activity level and develop recommendations

- Refer to completed evaluation
- Discuss barriers to exercise
- Identify physical activity most likely to fit into participant's lifestyle considering
- ability/preferences
- Discuss Participant's physical activity goals
- Identify services that may support exercise eg. Buddy up with other participants,
- clubs, groups, spouse etc
- Consider appropriate resources for participants to support goals

To complete

1. Client record (for coaches use only)
2. Coaching contract (summary copy posted to participant)

Length of time

Record length of phone coaching session (average reported 30 minutes in literature)

First follow-up (Participant to be phoned 1 month after baseline contact)

Second Follow-up (Participant to be phoned 2 months after 1 month contact)

Third Follow-up (Participant to be phoned 2 months after 3-month contact)

1. Prior to telephoning Participant, review information from previous telephone contact i.e. stage of change, dietary goals, physical activity goals, anthropometric measures (i.e. weight, waist, BMI) plus completed current evaluation questionnaire.

2. Re-establish rapport and acknowledge recently completed evaluation

3. Dependent on stage of change as to intervention, plus reassess or monitor any change

4. Evaluate progress since last phone call

5. Consider change to Participant's behaviour that could lead to improved dietary

and exercise patterns that support weight/body fat loss. For example

- Self-monitoring: records of eating & exercise
- Stimulus control i.e. reducing/avoiding triggers to poor eating/activity
- Problem solving offering alternatives
- Contingency management
- Self-talk

Social support

6. Modify management program and goals

7. Consider appropriate resources for Participant to support goals

8. Arrange for date of next telephone contact (not applicable for third follow-up)

9. Review changes made and actions/strategies undertaken, barriers overcome (in last follow-up)

10. Post out coaching contract and requested resources

To complete Coaching contract

Length of time

Record length of phone coaching session (average reported 20 - 30 minutes in literature).

Appendix I. Coaching Contract

COACHING CONTRACT

INDUSTRY “WAIST” DISPOSAL CHALLENGE

ID

Dear ,

Please find below a summary of your coaching session.

☺ **Coaching Session:** ☐ Baseline ☐ 2nd follow-up ☐ 3rd follow-up ☐ 4th follow-up

☺ **Date of Session** (dd.mm.yy): **Date of Next Session** (dd.mm.yy):

☺ **Current weight** (kg): **Height** (cm): **BMI:** **Age:**

☺ **Goals**

Pedometer use: ☐

Weight Loss (kg) :		Time Period (weeks):	
Current Physical Activity			
Type1:	T2:	T3:	T4:
Duration1 (min.):	D2:	D3:	D4:
Frequency1:	F2:	F3:	F4:
Future Physical Activity			
Type1:	T2:	T3:	T4:
Duration1 (min.):	D2:	D3:	D4:
Frequency1:	F2:	F3:	F4:
Dietary Behavior (suggested changes)			
Fat:			
Fibre:			
Alcohol:			
Portion size:			
Other:			

☺ **Suggestions by participant to overcome perceived barriers**

☺ **Referrals made by coach:**

- ☐ **GP**
- ☐ **Other Health Professional:**
- ☐ **Gym or other sporting activities:**
- ☐ **Other:**

Thank you very much for you cooperation

Coach Name

COACHING CONTRACT
INDUSTRY “WAIST” DISPOSAL CHALLENGE

Second Page for Study Purpose Only

Participant's address:

ID

(#
street,
suburb
post
code)

☺ **Participant co morbidities diseases :**

☺ **N° Phone Call Attempts:**

Duration of this Session (min.) :

☺ **Coach comment about call attempts:**

☺ **Stage of Change for weight loss:** ☐ (1) Pre-Contemplation ☐ (2) Contemplation

☐ (3) Preparation ☐ (4) Action ☐ (5) Maintenance

☺ **Stage of Change for physical act:** ☐ (1) Pre-Contemplation ☐ (2) Contemplation

☐ (3) Preparation ☐ (4) Action ☐ (5) Maintenance

☺ **Was there any weight loss or any other lifestyle change triggered by participating in the monthly BMI challenge:**

☺ **Barriers to achieving goals (please specify health, social or emotional problems)**

☺ **Resources (eg pamphlets) provided to client by coach:**

Coach Name

Thank you very much
Kristi Holloway

kristi.holloway@student.curtin.edu.au

University address

Curtin University
Western Australian Centre for Cancer and
Palliative Care
Shenton Park Perth, Western Australia

Ph: 08 98451716 Mob: 0408094674

Postal address

Curtin University
Western Australian Centre for Cancer &
Palliative Care
Att: Kristi Holloway
PO Box _____
Albany WA 6331

Adapted from Aoun et al. 2009

Industry 'Waist' Disposal Project

Interview Protocol

- Purpose:** Semi-structured interviews are being used in this study to explore the different stages of change through the experiences of participants involved in the self-management program. Also interviews will be utilised to gain information on the perceived strengths and weaknesses of the self-management program being facilitated in work sites.
- Participants:** Interviews will be conducted with selected participants. Participants will be selected to represent different stages of change.
- Time:** It is expected that the interview will last for approx 15-30 minutes.
- Audio-taping:** With the permission of the participants, the discussion will be taped and transcribed. The transcripts will be referred to for direct quotes.
- Analysis:** The transcripts will be subject to content analysis.

1. Can you please tell me which statement best describes you?

a. Which statement below best describes you for weight loss:

- I am not thinking about losing weight ☐
- I am thinking about losing weight, but not in the next fortnight or so ☐
- I am thinking about losing weight, in the next fortnight or so ☐
- I am trying to lose weight at the moment ☐
- I have achieved my weight loss goal ☐

b. Which statement below best describes you for eating less fat:

- I am not thinking about eating less fat ☐
- I am thinking about eating less fat, but not in the next fortnight or so ☐
- I am thinking about eating less fat, in the next fortnight or so ☐
- I am trying to eat less fat at the moment ☐
- I have achieved my goal for eating less fat ☐

c. Which statement below best describes you for exercising:

- I am not thinking about increasing the amount of exercise I do ☐
- I am thinking about increasing the amount of exercise I do, but not in the next fortnight or so ☐
- I am thinking about increasing the amount of exercise I do, in the next fortnight or so ☐
- I am trying to increasing the amount of exercise I do at the moment ☐
- I have achieved my exercise goal ☐

Questions specific to SOC, as determined above;

a. Pre-contemplation

Can you tell me why are you not thinking about losing weight or changing your lifestyle?

b. Contemplation

Can you tell me why are you are only thinking about losing weight/eating less fat or exercising and don't plan to do anything about changing your lifestyle?

c. Preparation

So you are thinking about it, and plan to do something in the next two weeks, can you tell me how you plan to make this happen?

d. Action

So you are currently losing weight/eating less fat/exercising? What has been a motivator for you?

e. Maintenance

So you have lost weight/eaten less fat/exercised as you wanted; how did you achieve this and how do you plan to maintain it?

3. How are you finding the Industry "Waist" Disposal program?

Prompts

Did you participate in the education sessions and/or the BMI competition and/ or the lifestyle coaching?

How did you find each of these parts of the project?

As a result, have you changed how you think and act related to your weight/health?

What do you like most about the program so far?

What did you like least?

4. What do you feel is hindering/helping you to adopt a healthier lifestyle?

Prompts

Why do you feel you couldn't lose weight/eating healthier/exercise more?

Are work/social commitments/ family responsibilities impacting on your ability to make changes?

How did you/or are you planning to overcome these barriers?

5. How do you feel the program could be changed to better help you?

6. How do you feel about maintaining the changes you have made towards adopting a healthy lifestyle?

7. Is there anything else that you would like to say about the program so far?

8. What else do you think you need to be successful in adopting healthy lifestyles?

Prompts

More education for you or your family

Increased support from your employers

More time

One on one support ie lifestyle coaching

Confidentiality Agreement of Transcriptionist

Study Title: Industry ‘Waist’ Disposal Challenge

Researcher: Kristi Holloway

PhD Student, Western Australian Centre for Cancer and Palliative Care,
Curtin University

Supervisors from Curtin University:

Professor Samar Aoun and Professor Duncan Boldy

My signature below indicates that I hereby agree that I understand that the information that I will transcribe for the study mentioned above is to remain confidential. I understand that the participants of this study have been guaranteed that the data they provided will remain anonymous. I have been given the opportunity to ask questions and all such questions have been answered to my satisfaction.

Transcriptionists Name

Researchers Name

Transcriptionists Signature

Researchers Signature

Date

Date